The
Southern Surgeon

Vol. XIV, No. 12 Copyrighted 1948 by
The Southern Surgeon Publishing Co. December, 1948

EXPERIENCES WITH TOTAL GASTRECTOMY

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TOTAL gastrectomy, pneumonectomy, pancreatoduodenectomy and the revived Wertheim hysterectomy, along with the extensive technical procedures of Brunschwig are examples of the present day trend toward a more vigorous and aggressive surgical attack upon visceral cancer. Although high subtotal gastric resections for ulcer or tumor have become an almost commonplace procedure in many hospitals, complete gastrectomy has hitherto occupied but a limited place in the surgeons' armamentarium and, for the most part, this operation has been reserved for certain rare forms of gastric carcinoma, notably the diffusely infiltrating scirrhous carcinomas commonly referred to as linitis plastica. The principal reasons for this restricted use have been: (1) the high primary operative mortality; (2) the high incidence of recurrence among survivors; (3) the frequently unsatisfactory clinical postoperative course; and (4) the theoretical or actual nutritional disturbances encountered following removal of the entire stomach. From a survey of the literature it now seems evident that many of these objections are no longer valid and that a reevaluation of the worth of this surgical procedure must be made.

The recorded experiences of many surgeons now afford conclusive evidence that the operation can be performed without an excessive mortality. Longmire[1] has recently reported 21 cases of total gastrectomy with only 2 deaths, or a mortality of less than 10 per cent. Smithwick[2] was able to collect from the literature, since 1942, reports of 103 cases of total gastrectomy (including his own) in which there were only 15 operative deaths. In his own series of 10

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Read before the sixteenth annual Postgraduate Surgical Assembly of The Southeastern Surgical Congress, Hollywood, Florida, April 7, 1948.

cases there were 2 deaths and both of these occurred before some of the newer refinements of technic were employed. Smith[3] at the Lahey Clinic reports an overall mortality of 29.1 per cent in a group of 89 cases and in the last 43 operations this had fallen to 16.3 per cent. From a study of the literature it is evident that the most common cause of death following this operation is leakage at the esophagojejunal anastomosis with resultant peritonitis. The frequency of disruption of this anastomosis is readily understandable when one considers the fragile texture of the esophageal wall, its lack of a peritoneal covering and the often unsatisfactory exposure of the operative field, a situation which makes accurate placement of the sutures a difficult task. Numerous ingenious methods have been proposed to prevent leakage at the esophagojejunal anastomosis. Notable among them are: (1) anchorage of the jejunal limb to the diaphragm to avoid tension at the suture line (Allen[4]) (fig. 1); (2) the development of peritoneal flaps from

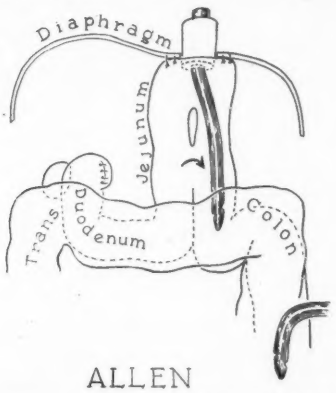

Fig. 1. Total gastrectomy with reconstruction as described by A. W. Allen showing attachment of jejunum to diaphragm, retrocolic anastomosis, entero-enterostomy and catheter jejunostomy for feeding.

the diaphragm to cover and reinforce the anastomosis (Lahey[5]); (3) enclosure of the anastomosis between the afferent and efferent jejunal limbs (Graham[6]) (fig. 2). However, general peritonitis may supervene in the absence of disruption. This is usually due to the inevitable contamination of the operative field by secretions from the oral cavity, material which often harbors the most virulent type of organisms. Debilitated patients such as those who require total gastrectomy do not well tolerate even minimal soiling of the peritoneum although the use of intensive sulfonamide and antibiotic therapy both before and after operation have been of great assistance. A method to avert the contamination attendant

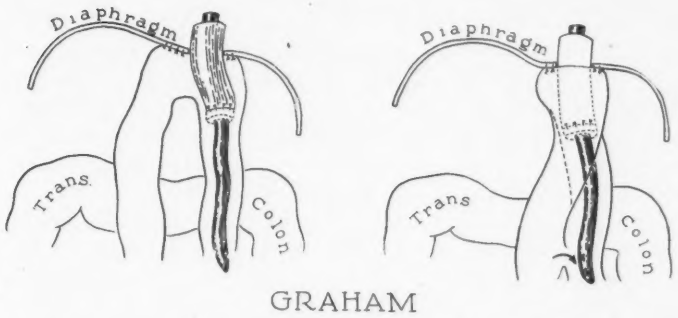

Fig. 2. Total gastrectomy with reconstruction by the method of Roscoe Graham. The jejunal loop is brought up anterior to the colon and the esophagus is anastomosed to the descending limb. The proximal limb is rotated and sutured over the anastomosis to protect it. The enteroenterostomy is essential.

upon an open anastomosis has been devised by Smithwick. He performs not only the esophagojejunal anastomosis but also an enteroenterostomy and the closure of the duodenal stump by an aseptic or closed technic, this maneuver being facilitated by the use of a special clamp.

Ample evidence is now available that cure of gastric carcinoma is possible by complete gastrectomy. Smithwick reports one patient living and well ten and one half years after operation and another five years and two months later. Smith presents pertinent data on 12 patients who survived three years or longer. The longest survival was that of a 29 year old woman, operated upon for a leiomyosarcoma, who was living and well eight years and five months after operation. Another patient who was operated upon for lymphosarcoma with involvement of the regional lymph nodes was living seven years and one month after operation. A third patient with carcinoma simplex and positive regional lymph nodes was alive and well five years and four months after operation.

The results of treatment of carcinoma of the stomach, as reported at present, leave much to be desired since the recurrence rate following the conventional partial or subtotal gastrectomy is discouragingly high, and in the last analysis the majority of operations are, in fact, palliative in character even though complete eradication of the disease seems likely at the time of laparotomy. Admittedly, the ideal approach to this problem lies in the development of methods to insure earlier diagnosis and the institution of proper therapy in an earlier stage of the disease. Great interest is manifested at the present time in the results of the microscopic studies of gastric washings for the identification of tumor cells according

to the method of Papanicolaou.[7] It is nevertheless conceivable that in the future by the utilization of more radical procedures than have been employed in the past, better results may be anticipated. The small number of survivors following total gastrectomy for cancer has undoubtedly been due to the conservative attitude of reserving this procedure for only the advanced cases in which no operation of lesser magnitude would suffice. A number of writers have recently proposed extension of the indications for total gastrectomy to some of the more favorable and smaller lesions (Smithwick, Longmire, Morton[8]). Such a policy would be in accord with the generally accepted principles of adequate cancer surgery.

Because in the past the number of patients who have survived total gastrectomy for an appreciable length of time has been so small, data concerning the state of health and relating to the nutritional problems involved following loss of the entire stomach have been meager; additional information is needed before entirely satisfactory conclusions can be drawn. It is nevertheless true that sufficient evidence has accumulated to demonstrate that such persons may live in reasonable comfort for an indefinite period and experience no serious impairment in digestive function or in the maintenance of a satisfactory blood picture. Certain of the abnormalities following complete gastrectomy which have been recorded are: (1) decreased ability to digest or absorb the dietary fats and/or proteins; (2) alimentary functional hyperinsulinism; (3) development of a hypochromic microcytic anemia or macrocytic anemia; (4) delayed intestinal motility, possibly the result of vagal interruption. Certain patients experience difficulty in eating due to a feeling of fulness or to regurgitation after the ingestion of food. These symptoms have generally been ascribed to rapid distention of the jejunum and fortunately they usually diminish as the jejunum dilates and takes over some of the reservoir functions of the stomach. Although certain patients never completely overcome them, the use of frequent small feedings affords the greatest relief. Most patients, however, have little difficulty ultimately and many soon are able to take normal feedings without discomfort. Some writers believe that an enteroenterostomy between the afferent and efferent jejunal limbs tends to overcome these troublesome symptoms and they also believe that this minimizes the complaint of heartburn, which is presumably due to regurgitation of fluids from the proximal jejunal loop into the lower esophagus. Orr[9] has suggested the employment of the Roux type of anastomosis using a blind arm of jejunum for junction with the esophagus, which he prefers to perform by the end-to-side method (fig. 3). Priestley[10] believes that in many instances an end-to-end anastomosis may be

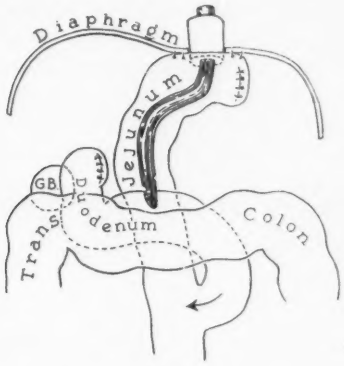

Fig. 3. Method for restoration of continuity advocated by Orr. An anastomosis of esophagus to jejunum is performed by the end-to-side method using a blind arm of jejunum. A Roux jejunojejunostomy completes the procedure.

made between esophagus and duodenum. Engel[11] has suggested utilization of the principle of the Finney pyloroplasty upon the jejunal loop just below the union with the esophagus in order to create a reservoir (fig. 4).

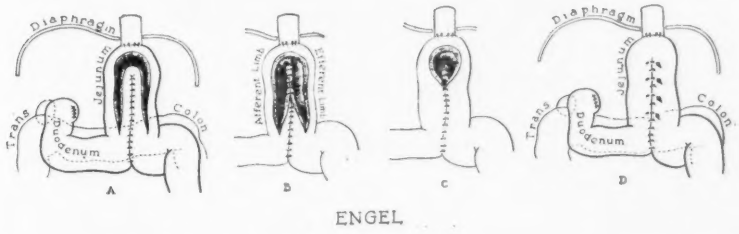

Fig. 4. Method of Engel whereby a jejunal reservoir is created by use of the principle of the Finney pyloroplasty.

Clinical Material

The present report is concerned with 68 cases of complete gastrectomy performed in the surgical clinic of the University Hospital during the past decade from October, 1937, to September, 1947. Among the cases so treated, the gastric lesions were: carcinoma 59, gastric ulcer 6, lymphosarcoma 2, neurofibroma 1. The series com-

prises 46 men and 22 women. The oldest patient was 81, the youngest 30, and the average age was 55 years. In the 61 cases of malignant disease, total gastrectomy was elected for the most part only when a lesser procedure would have been impossible or obviously inadequate for the problem at hand. It was not chosen for lesions limited to the pylorus or antrum although ultimately this

Fig. 5. Roentgenogram showing extensive gastric neoplasm producing the clinical picture of linitis plastica. Note the actual visualization of the thickened gastric walls. Almost the entire stomach is involved.

may prove to be the best solution to this problem. In the earlier part of the series, the cases as judged by the findings at operation were very carefully selected, and in these the requirements were that the lesion be limited to the stomach and the adjacent lymph nodes and that grossly all of the disease be removed by the operative procedure. As experience has increased and the mortality of the operation has been lowered, the indications have been somewhat extended and this has been reflected in a higher incidence of early recurrence. The operation was never chosen as a frankly palliative procedure in cases with hepatic or peritoneal metastases, contrary to our usual custom in regard to subtotal gastrectomy, which we now believe to be the best palliative procedure for cases not curable. In the 61 cases of malignancy, the location of the lesion was as follows:

1. Involvement of all or nearly all of the stomach. Many of these were the linitis plastica type of tumor (fig. 5). 40
2. Smaller lesions situated in the upper half or third of the stomach but without gross involvement of the esophagus (fig. 6). 11
3. Lesions at first appearing to be limited to the lower or middle portion of the stomach, but proving, as the dissection progressed, to extend cephalad intramurally for an indefinable distance. In this type of case a subtotal resection was at first attempted, but on attempting to apply the von Petz clamp, it was apparent that the transection was through neoplasm tissue and accordingly the resection was extended so as to include the entire stomach. 10

Fig. 6. Roentgenogram showing constrictive lesion of upper third of stomach producing hour-glass deformity. Neoplasm considered probable.

The 6 cases of gastric ulcer were practically identical. All of the lesions were situated in the extreme upper portion of the stomach on the lesser curvature or posterior wall. All were originally diagnosed by roentgen examination as benign ulcers. Prolonged intensive medical treatment failed to bring about closure of the ulcer crater as evidenced by check-up roentgenograms and gastroscopy. The obvious conclusion was reached that the lesion was malignant and resection advised. The findings at the time of laparotomy were

those of benign ulcer. Adequate removal seemed best accomplished by complete gastrectomy. All lesions proved on subsequent histologic examination to be benign gastric ulcers. In retrospect it might seem that total gastrectomy under these circumstances was a too radical procedure. Alternative and perhaps superior measures which might be employed are transthoracic partial gastrectomy (Sweet[12]) or vagotomy (Harper and Dragstedt[13]) with or without complementary gastroenterostomy. In any event, in such cases it would seem desirable that sufficient tissue for microscopic study be obtained before compromising on an indirect attack or local excision.

The single example of operation for a benign tumor was the case of a 40 year old woman who proved to have a large hour-glass neurofibroma involving practically all of the lesser curvature and characterized clinically by repeated and massive hemorrhages. Microscopic study of the tumor revealed no evidence of sarcomatous proliferation. This group of cases, i.e., neurofibroma and leiomyoma and their malignant counterparts, neurogenic sarcoma and leiomyosarcoma, are among the most satisfactory of the gastric neoplasms for treatment, and, while they often attain considerable size, the condition of the patient is usually good and even in the sarcomatous phase the degree of malignancy is low and recurrence is rare, provided that the removal has been adequate.

Technical Considerations

Preoperative Care: Since many of these patients show evidence of nutritional disturbances, e.g., anemia, dehydration, hypoproteinemia and avitaminosis in an unusual degree, intensive preparatory therapy is of the utmost importance and a week or more in the hospital may be required. In addition to the regimens usually employed for the correction of these disorders, attention to oral hygiene is important. Necessary extractions and dental prophylaxis assist in reducing the hazard of serious infection due to the escape of secretions from the esophagus when it is open during the anastomosis. Sulfadiazine by mouth for several days and penicillin intramuscularly for 24 to 48 hours prior to operation seem to be of value. A Levine tube is placed through the nose and into the stomach and attached to the Wangensteen apparatus before operation. This insures having the stomach empty and during the operation the tube can be adjusted so as to lie in the lower esophagus as the operation proceeds, thus removing any pooled secretions. It is later passed through the anastomosis into the upper jejunum. It is left for several days after operation. An intravenous infusion of 5 per cent dextrose solution is started prior to operation and this is followed by blood during the course of the procedure. At least

1000 c.c. of whole blood during the operation is desirable and if excessive bleeding is encountered, even more may be required.

Anesthesia: Adequate relaxation is necessary and, since the operation may be of long duration, spinal anesthesia with the exception of the fractional type may be unsatisfactory. Our preference at the present time is the intratracheal administration of gas-oxygen-ether supplemented by curare. A general anesthetic has the additional advantage that the Trendelenberg position may be employed during the esophageojejunal anastomosis, a point that may expedite the performance of this part of the operation.

Incision: Our choice regarding incisions is a long, slightly curved transverse incision above the umbilicus. Both rectus muscles are transected. This is joined at its midpoint by a short vertical linea alba incision extending upward to the xiphoid. The closure is effected by the use of interrupted nonabsorbable sutures throughout. These may be of fine wire, silk or cotton. Since wound infection has been slightly more common in total gastrectomy than in other abdominal operations, the method of delayed primary closure has been frequently employed to advantage.

Operative Procedure: In all of the cases included in this report an end-to-side anastomosis between the end of the esophagus and the jejunal loop was performed. In all of them the jejunum was anchored to the diaphragm in order to eliminate tension at the suture line and for the most part the technic originally described by Allen was followed. Thus, in 63 of the 68 cases, this technic was employed. In 58 of these cases a posterior or retrocolic anastomosis, which is preferred by Allen, was used and in only 5 was an antecolic connection made. These 5 patients had either a short transverse mesocolon or other anatomic peculiarities precluding the posterior type of union. A complementary enteroenterostomy was used in 32 cases and omitted in 31. There is a considerable difference of opinion regarding the necessity of this by-pass. It probably is of value in (1) minimizing tension in the proximal loop during the early convalescence and thereby protecting the recently closed duodenal stump; (2) later in preventing duodenal contents from entering the lower esophagus and thus in reducing the incidence of such symptoms as heartburn or regurgitation. It seems to have little effect upon the troublesome symptoms experienced by certain patients of fulness or pain after eating as this seems to be due to the sudden distention of the segment of jejunum into which the esophagus empties.

The technic of Roscoe Graham was used in 5 cases. Graham believes that by enclosing the anastomosis between the two jejunal

limbs, the danger of peritonitis from leakage is reduced. He prefers an antecolic anastomosis and since obstruction of the proximal loop necessarily occurs, the enteroenterostomy must be performed. In this small group of cases we have had no instances of leakage at the anastomosis.

The desirability of splenectomy is also a debatable point. The chief indications for it are: (1) involvement of the spleen or the nodes at the hilus by neoplasm; (2) improvement in the exposure in the operative field; (3) to control easily bleeding from laceration of the splenic capsule. In this series the spleen was removed in 29 cases and left intact in 39. As a rule, the operation is expedited by the removal of the spleen and we have observed no untoward effects consequent upon its removal.

A complementary jejunostomy for feeding was employed in 51 cases but not performed in 17. It is a simple expedient which requires but a few additional minutes and is useful for feeding during the early convalescence. We have had no instances in which obstruction at this site developed or in which intestinal fistulae persisted and we believe that it is to be recommended.

Sulfonamide drugs or penicillin are not used intraperitoneally but penicillin in doses of 100,000 units is administered systemically every 3 hours for the first few days after operation, the duration of this treatment and the dosage being adjusted according to indications as they arise. Additional blood transfusions are usually given during the postoperative period.

TABLE I

Cause of Operative Deaths

With Autopsy	*Number of Cases*	
Peritonitis (Leak at Esophagojejunal Anastomosis)	7	
Peritonitis (No Leaks)	2	
Pulmonary Embolism and Pneumonia	1	
Subphrenic Abscess	1	
Volvulus Proximal Jejunal Loop (Roscoe Graham operation)	1	
		12
Without Autopsy		
Peritonitis—Leak	1	
Pneumonia	1	
		2
Operative Deaths		14
Mortality 20.6 per cent		

Mortality

There were 14 operative deaths among the 68 patients, or an

operative mortality of 20.6 per cent. According to lesions, there were 12 deaths in 59 cases of carcinoma, a mortality of 20.3 per cent; 1 death in 6 cases of gastric ulcer, a mortality of 16.7 per cent, and 1 death in 2 cases of lymphosarcoma. Table I gives the causes of death. It will be noted that the most common fatal complication was peritonitis; this was proved at autopsy in 10 cases and there was unmistakable clinical evidence of it in an additional case. Leakage at the esophagojejunal anastomosis must be assumed in this case. In the 10 cases examined postmortem, leakage at the main anastomosis was demonstrated in 7, whereas in 2 no demonstrable leaks at any of the suture lines could be found. In one case, volvulus of the proximal jejunal limb in a Graham type of reconstruction following resection for a benign ulcer occurred. The bowel had become gangrenous and exhibited multiple points of perforation. The single example of fatal subphrenic abscess verified at autopsy must be attributed to slow leakage at the anastomotic site.

TABLE II

Microscopic Study of Ends of Specimen in 49 Cases of Carcinoma

upper +	lower —	16
upper —	lower +	6
both —		20
both +		7

Regional Lymph Node Involvement in 52 Cases of Carcinoma

Nodes	Positive	41
Nodes	Negative	11

Surgical Pathology

In the microscopic study of the operative specimens an attempt was made to examine sections taken from the upper end and the lower end of the specimen in addition to those from the main lesion or tumor mass. Such data are available in 49 of the cases of carcinoma and are presented in Table II. It was discouraging to find that in the upper end in 23 cases, there was microscopic evidence of submucosal infiltration by neoplasm even when at operation the level at which the esophagus was transected seemed to be normal. Involvement of the lower end up to the line of transection was found in 13 instances. These findings would indicate that recurrence must be expected and subsequent events proved this prediction to be true. These facts would tend again to emphasize the fact that total gastrectomy has too often been reserved for the advanced cases in which the chances of cure are remote by any known method of treatment and to suggest that this more radical and more ideal opera-

tion, from the viewpoint of good cancer surgery, might well be employed in patients with less extensive lesions with an appreciable improvement in the end results. Involvement of regional lymph nodes is a matter of interest and in 52 cases of carcinoma the nodes were found to be positive in 41 and negative in only 11. The regional lymph nodes were involved in the 2 cases of lymphosarcoma.

Postoperative Course

Early rising has been employed in this clinic for several years with great satisfaction and is applicable to most cases of total gastrectomy. Jejunal suction is continued for 3 or 4 days and the Levine tube is then removed and small feedings are started by mouth. If a jejunostomy has been performed, the administration of a formula is started soon after operation. Fluids given in this manner simplify the intravenous fluid therapy program and many patients can tolerate a fairly high caloric intake in this way. Pulmonary complications have been reduced to a minimum by avoiding an excess of sodium chloride in the intravenous fluids, by tracheobronchial suction or aspiration bronchoscopy and with the aid of sulfadiazine and/or penicillin. The lower extremities are carefully watched for evidence of phlebothrombosis and if this is detected, it is treated usually by superficial femoral vein ligation or occasionally by heparin and dicumarol. In the average case the convalescence is remarkably smooth and uneventful. The problem of maintaining an adequate daily caloric intake after discharge from the hospital is sometimes a difficult one. Frequent small feedings seem to be better tolerated than food in larger quantities. Hourly feedings, using the formula recommended by Varco,[14] may be necessary for a time. Occasionally in the early weeks or months of convalescence slight scar contracture at the anastomosis may cause some narrowing with resultant dysphagia. When this is the case, gentle dilatation by the use of Hurst dilators promptly relieves the situation. Dysphagia developing at a later date is almost invariably due to local recurrence at the anastomotic site.

Follow-up Studies

Of the 54 patients who survived the operation, 40 have subsequently died. Table III outlines the duration of life in 39 cases of malignancy, all of which were carcinoma except one of lymphosarcoma, that of a 65 year old woman who survived for six months and died of extensive recurrence. Autopsy in this case revealed generalized lymphoblastomatosis. It will be seen that approximately one third of the patients lived for six months or less, one third from six months to a year and one third over one year. As

TABLE III

Postoperative Course of 39 Patients Who Survived Operation and Have Subsequently Died (Carcinoma 38—Lymphosarcoma 1)

Survival Period	*Number of Cases*
6 months or less	13
6 to 12 months	13
12 to 18 months	10
18 to 24 months	1
Over 2 years	2
Longest survival period.....2 years, 4½ months	
Shortest survival period.....2 months	
Average survival period.....10 + months	

far as can be ascertained, death in all cases was due to recurrence of the original disease. The average survival period in this group of patients who have died was slightly less than one year. In Table IV, data are given regarding the 9 patients operated on for carcinoma who are still living. Three of these patients have survived

TABLE IV

Patients Living Following Operation for Carcinoma

Patient		*Duration*	*Result*
1. M. M.	(Reg. No. 372675)	8 yrs. 10 mos.	Excellent
2. L. G.	(Reg. No. 464999)	7 yrs.	Good Macrocytic anemia—4½ yrs.
3. D. G.	(Reg. No. 502805)	5 yrs. 4 mos.	Good
4. R. O.	(Reg. No. 567092)	2 yrs. 5 mos.	Recurrence
5. S. W.	(Reg. No. 584076)	1 yr. 7 mos.	Satisfactory
6. A. A.	(Reg. No. 602687)	10 mos.	Fair
7. N. F.	(Reg. No. 89484)	4 mos.	Fair
8. V. S.	(Reg. No. 292550)	4 mos.	Satisfactory
9. R. K.	(Reg. No. 619442)	1 mo.	——

for more than five years and are free of recurrence. One patient is living at two and one half years with extensive recurrence and the remaining 5 have been operated upon too recently for final evaluation. Thus, 3 patients, or 6.25 per cent, of the 48 successfully operated upon for malignant disease may be regarded as five year cures. Calculated on the basis of all of the patients operated upon for malignancy (61 cases) the five year curability becomes 4.92 per cent. Of especial interest among the survivors is the matter of physical and economic rehabilitation. The patient who has survived for the longest period, i.e., eight years and ten months, has an excellent clinical result. He has resumed his former occupation, has normal eating habits and is in all respects well. While the regional lymph nodes were involved and there were neoplasm cells

in the blood and lymph vessels, the location of the primary lesion was unique in that it occupied the upper half of the greater curvature of the stomach. The second longest survivor is a woman who had an extensive local lesion but negative lymph nodes. The third five year survivor had a total gastrectomy for what ultimately proved to be a relatively small antral lesion. The major part of the extensive thickening of the gastric wall, observed at operation and interpreted as tumor, proved, on microscopic examination, to be due to hypertrophic gastritis.

TABLE V

Follow-up Operations for Benign Lesions

Lesion	*Duration*	*Result*
Gastric Ulcer	6 yrs. 5 mos.	Poor (macrocytic anemia—hypoglycemia)
Gastric Ulcer	5 yrs. 3 mos.	Excellent
Gastric Ulcer	1 yr. 7 mos.	Satisfactory
Gastric Ulcer	8 mos.	Died (intestinal obstruction)
Gastric Ulcer	5 mos.	Fair
Neurofibroma	9 yrs. 4 mos.	Satisfactory

Table V gives data relevant to those patients who survived the operation for benign lesions of the stomach: i.e., gastric ulcer 5, and benign tumor 1. There was one operative death following resection for a gastric ulcer. A man of 50, with a juxtaesophageal gastric ulcer, the patient who has survived for the longest period, six and one half years, admittedly has a poor clinical result. He has severe postresection symptoms. Macrocytic anemia developed five and one half years after operation, and he presents a striking example of alimentary functional hyperinsulinism. All symptoms are greatly magnified due to an underlying psychoneurotic disorder. The second patient, a man of 36, who has survived for over five years, has a truly excellent result. Two additional patients have been followed for an insufficient period of time to warrant a final appraisal of their results. One patient was progressing satisfactorily for eight months following operation, whereupon he developed acute small bowel obstruction due to adhesive bands and from this he succumbed.

The patient operated upon for the benign gastric neurofibroma represents the longest survival in the series since nearly ten years have elapsed following the laparotomy. According to all labora-

tory and clinical tests, there are but few deviations from normal and these are of slight significance. She has for some time complained of symptoms compatible with gallbladder disease, and recently gallstones have been demonstrated by cholecystography, and cholecystectomy is contemplated.

Physiologic Considerations

A matter of interest in arriving at a decision as to whether complete gastrectomy is a satisfactory procedure is the nutritional state of patients who have survived for a considerable time after operation. Unfortunately in the past, the number of patients who have survived for an appreciable length of time has been so small that relatively little information has been available.

Blood: Theoretically, after complete removal of the stomach, because of the elimination of the intrinsic factor of Castle, macrocytic or pernicious anemia might be expected to follow. Experimentally, however, it has not been possible to produce this type of anemia in animals by extirpation of the stomach. Clinical experience is likewise in accord with these findings. In the present series of cases only two instances of macrocytic anemia have been observed. One occurred in a woman four and one half years after operation for cancer and the other in a man five and one half years after an operation for benign ulcer. In view of the rarity of this complication and the unpredictable time of its onset, we have not routinely advised liver extract or folic acid. The reasons are: (1) in many cases it is entirely unnecessary and subjects the patients to unnecessary expense and inconvenience; (2) since these patients have been followed routinely at the Simpson Memorial Institute, we have been desirous of not obscuring the picture in order that accurate observations may be made; (3) if and when macrocytic anemia does develop it can promptly be brought under control by appropriate therapy. In the first case referred to above, a prompt remission was obtained by liver extract and in the second, treatment by folic acid was equally satisfactory. It is of interest that the patient in this series who has survived for the longest time, i.e., nine years and four months, has shown no evidence of macrocytic anemia.

Hypochromic microcytic anemia is more commonly encountered and is due to the impaired ability to absorb or utilize iron ingested in the food. The inorganic iron of the diet which is in the ferric state, in the normal individual is converted into the ferrous form by the action of the hydrochloric acid of the stomach. Iron, to be absorbed from the digestive tract, must be in the ferrous state. Since the absence of hydrochloric acid after gastrectomy disturbs the usual process, an iron deficiency type of anemia ensues. While

hydrochloric acid may be given with the diet, substitution therapy, i.e., ferrous sulfate 0.32 Gm. t.i.d. for one week each month seems to protect against hypochromic microcytic anemia. This regimen is recommended for all patients at the time of discharge from the hospital and should be continued indefinitely.

Carbohydrate Metabolism

It has been observed that some patients following gastroenterostomy or partial gastrectomy experience severe weakness and fatigue two or three hours after meals. This syndrome has been even more marked in certain cases of total gastrectomy, and has been termed by Conn[15] alimentary functional hyperinsulinism. The oral dextrose tolerance curve affords an explanation of the phenomenon. It is characterized by: (1) a normal fasting blood sugar; (2) a rapid rise to hyperglycemic levels (usually between 200 and 300 mg. per cent) during the first hour after the ingestion of dextrose and (3) a precipitous fall to hypoglycemic levels between the second and fourth hour. The initial hyperglycemic phase is due to abnormally rapid absorption of dextrose by the intestine. This is due to the lack of the reservoir or storage capacity of the stomach and the loss of the mechanism (pylorus) regulating the discharge of chyme into the intestine. Instead of an intermittent discharge of small quantities by way of the pylorus, excessively large quantities are suddenly released into the jejunum and in turn abnormally rapid absorption into the blood stream follows. The resulting high blood sugar exerts an excessive insulogenic stimulus upon the normally functioning islet cells of the pancreas with the resultant elaboration of large quantities of insulin. This in turn accounts for the rapid fall of blood sugar to a subnormal level in the second or third hour. Therapy consists in an effort to prevent the marked post prandial hyperglycemia and this is best accomplished by a high protein, low carbohydrate diet.

Fat Metabolism

In the study of 3 patients, six months after total gastrectomy, Rekers, Pack and Rhoads[15] found decreased ability to digest or absorb the fat of the diet. Longmire, in 3 patients, studied seven months or more after operation found a large amount of unabsorbed fat excreted in the stool. Since the number and character of the stools had been normal, it was assumed that the fat of the diet had been digested but that absorption had been impaired. In the patients studied by us[17] significant errors in fat metabolism were not observed.

Wollaeger, Comfort, Weir and Osterberg,[17] in a study of pa-

tients who had undergone partial gastrectomy with a Polya type of anastomosis, found that nearly all of them lost more fat in the stool when taking a high fat diet than did a series of controls. Excessive loss of fat was also observed in some patients who received a diet of ordinary fat content. Some patients following the Polya type of partial gastrectomy lost more nitrogen and total solids in the stool than did normal persons. However, in most instances, the excessive amounts of fat and nitrogen in the feces were not large. Among the factors by which these losses may be explained are: (1) rapid emptying of the stomach; (2) increased intestinal motility; (3) diminished flow of pancreatic enzymes or bile due to impairment of the mechanism for stimulation of such flow; (4) imperfect mixing of food with digestive ferments because of the shunting of gastric contents away from the duodenum.

Findings similar to these have been reported by MacDonald, Ingelfinger and Belding[18] as the result of their studies of 2 patients who had survived total gastrectomy for ten years and three years, respectively. These authors found that fat absorption on a low fat intake was not significantly altered. However, in a third patient who had survived total gastrectomy, splenectomy and partial pancreatectomy for five years, the absorption of fat was appreciably impaired.

Motility: In the early convalescence following subtotal gastrectomy, barium or food may traverse the intestinal tract more rapidly than normal, presumably due to the rapid emptying of the stomach. Later intestinal motility may be retarded, probably due to the loss of the vagus motor control. In total gastrectomy both vagus nerves are of necessity divided. Radiographic studies in these patients conducted long enough after operation for a physiologic adjustment to have taken place confirm this finding of decreased intestinal motility. In many cases dilatation of the upper jejunum adjacent to the anastomosis may be demonstrated roentgenologically. Motility studies by means of balloons of this segment have demonstrated little or no peristaltic activity. This development of a miniature stomach presumably represents an attempt on the part of the body to compensate for the loss of the normal reservoir function of the stomach.

Summary and Conclusions

In attempting to evaluate the worth of total gastrectomy in malignant disease, one finds that by accepting an appreciable but not formidable operative mortality, a small number of five year cures can be obtained. A few of these patients have excellent clin-

ical results; whereas the remainder, even though they are not entirely well, are enabled to live a fairly comfortable and useful life. In this group of cases the procedure is definitely worth while. In the case of patients who live for only a year or less, and die of recurrence, it is sometimes doubtful whether the results justify the risk and effort involved. For these patients the operation is in reality only a palliative one and unfortunately only too often fails to palliate. It is this group of patients who experience the greatest difficulty with postresection symptoms, in tolerating feedings and in gaining weight or strength. It seems quite probable that many of their symptoms are due to early recurrence. It is unfortunately true that it is frequently impossible from the findings at operation to predict the future course as some of the patients with what seemed to be most unfavorable lesions have done well, while the converse is often the case. It would seem that in the future it would be better to enlarge the indications for total gastrectomy by including some of the smaller and more favorable lesions, rather than by attempting to cure borderline or frankly inoperable lesions. The former group of patients are on the whole better risks, the technical difficulties are less and therefore the number of five year survivals might be increased without an appreciable increase in operative mortality.

For the benign gastric neoplasms or the sarcomas of low malignancy a high percentage of cures may be expected. Since many of these tumors attain great size before the diagnosis is made, it seems probable that total gastrectomy will be necessary in many such cases for the complete eradication of the growth.

With regard to benign juxtaesophageal gastric ulcers, it seems unnecessarily dangerous, and more or less crippling in its effect, to sacrifice the entire stomach for a non-malignant lesion merely because of its high position. A tempting solution to this problem is the one suggested by Harper and Dragstedt; i.e., a trial of vagotomy to be followed by resection later if healing of the ulcer fails to take place. While vagotomy has not generally been endorsed by surgeons for the treatment of gastric ulcer, this small but unique group of cases may well be an exception to the general rule.

BIBLIOGRAPHY

1. Longmire, W. P.: Total Gastrectomy for Carcinoma of Stomach, Surg., Gynec. & Obst. *84:*21-30 (Jan.) 1947.
2. Smithwick, R. H.: Total Gastrectomy, New England J. Med. *237:*39-47 (July) 1947.
3. Smith, F. H.: Total Gastrectomy: Report of 89 Cases, Surg., Gynec. & Obst. *84:*402-408 (April) 1947.

4. Allen, A. W.: (a) Carcinoma of the Stomach with Special Reference to Total Gastrectomy, Ann. Surg. *107:*770-782 (May) 1938.
(b) Total Gastrectomy for Carcinoma of the Stomach, Am. J. Surg. *40:*35-41 (April) 1938.
5. Lahey, F. H.: Complete Removal of the Stomach for Malignancy: Report of Five Surgically Successful Cases, Surg., Gynec. & Obst. *67:*212-223 (Aug.) 1938.
Lahey, F. H., and Marshall, S. F.: Combining Splenectomy with Total Gastrectomy, Surg., Gynec. & Obst. *73:*341-344 (Sept.) 1941.
Indications for and Experience with Total Gastrectomy; Based upon 73 Cases of Total Gastrectomy, Ann. Surg. *119:*300-320 (March) 1944.
6. Graham, R. R.: Technique for Total Gastrectomy, Surgery *8:*257-264 (Aug.) 1940.
7. Papanicolaou, G. N.: Diagnostic Value of Expoliated Cells from Cancerous Tissues, J.A.M.A. *131:*372-378 (June 1) 1946.
8. Morton, C. B., II: Total Gastrectomy: Indications for Operation with a Report of 4 Cases, Arch. Surg. *44:*72-80 (Jan.) 1942.
9. Orr, T. G.: A Modified Technic for Total Gastrectomy, Arch. Surg. *54:*279-286 (March) 1947.
10. Priestley, J. T.: Esophagoduodenal Anastomosis in Total Gastrectomy, to be published in Arch. Surg.
11. Engel, G. C.: Creation of Gastric Pouch following Total Gastrectomy, Surgery *17:*512-523 (April) 1945.
12. Sweet, R. H., in discussion of Colp, R., and Druckerman, L. J.: Palliative Gastrectomy in Selected Cases of Gastric Ulcer, Ann. Surg. *124:*675-687 (Oct.) 1946.
13. Harper, P. V., Jr., and Dragstedt, L.: Section of Vagus Nerves to Stomach in Treatment of Benign Gastric Ulcer, Arch. Surg. *55:*141-150 (Aug.) 1947.
14. Varco, R. L.: Preoperative Dietary Management for Surgical Patients, with Special Reference to Lesions of Stomach and Duodenum, Surgery *19:*303-378 (March) 1946.
15. Rekers, P. E.; Pack, G. T., and Rhoads, C. P.: Metabolic Studies in Patients with Cancer of Gastrointestinal Tract. VI. Disorders in Alimentary Digestion and Absorption in Patients who have Undergone Total Gastrectomy for Carcinoma of Stomach, Surgery *14:*197-215 (Aug.) 1943.
16. Farris, J. M.; Ransom, H. K., and Coller, F. A.: Total Gastrectomy: Effects upon Nutrition and Hematopoiesis, Surgery *13:*823-833 (June) 1943.
17. Wollaeger, E. E.; Comfort, M. W.; Weir, J. F., and Osterberg, A. E.: Total Solids, Fat and Nitrogen in Feces. II. Study of Persons who had Undergone Partial Gastrectomy with Anastomosis of Entire Cut End of Stomach and Jejunum (Polya Anastomosis), Gastroenterology *6:*93-104 (Feb.) 1946.
18. MacDonald, R. M.; Ingelfinger, F. J., and Belding, H. W.: Late Effects of Total Gastrectomy in Man, New England J. Med. *237:*887-895 (Dec.) 1947.

PRIMARY CARCINOMA OF THE GALLBLADDER

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The abdominal surgeons may at any time in the course of gallbladder surgery be confronted with a primary carcinoma of the gallbladder. This neoplasm is not as rare as generally believed, and its recognition and careful, adequate surgical extirpation is exceedingly important to the patient's welfare. The concept that carcinoma of this structure can rarely be treated by surgical removal is false. It is the aim of this report to present a complete study of 19 cases of primary carcinoma of the gallbladder. Cases of carcinoma of the extrahepatic ducts and sarcomas and malignant neurogenic tumors of the gallbladder are purposely omitted.

Incidence

In our experience, the frequency of occurrence of primary carcinoma of the gallbladder is worthy of comment. This neoplasm was first described by Maximilian Stoll of Vienna in 1777. Until the latter part of the nineteenth century, only a few cases had been recorded in the literature. To the present time, approximately 2300 cases of this neoplasm have been presented. The postmortem incidence of carcinoma of the gallbladder is indicated in Table 1.

TABLE 1

	No. of Autopsies	*Percentage*
Illingworth	13,034	0.33
Jankelson	11,400	0.27
Kirshbaum	13,330	0.40
Berencsy and Von Wolff	19,908	0.85
Gariepy and Gardner	900	0.11

Thus, the incidence varies from 0.11 per cent at Mount Carmel Mercy Hospital to 0.85 per cent at other institutions. These figures are quite constant and reliable.

The surgical incidence of primary carcinoma of the gallbladder is illustrated in Table 2.

It is immediately seen that the figures are considerably higher. However, at our hospital, the surgical and postmortem incidence

Read before the sixteenth annual Postgraduate Surgical Assembly of The Southeastern Surgical Congress, Hollywood, Florida, April 5-8, 1948.

TABLE 2

Name	*No. of Operations*	*Percentage*
MacCarty	5,000	0.50
Magoun and Renshaw	7,878	1.06
Judd and Gray	22,365	0.90
Erdmann	525	1.16
Mohardt	35,000	1.12
Hochbert and Kogut	1,200	2.50
Weiss	1,500	3.00
Gariepy and Gardner	1,777	1.01

is practically identical. The diagnosis of primary carcinoma of the gallbladder was very carefully established. Five other cases were discarded since our pathologist was unable to establish the primary site definitely in the gallbladder itself. The cases reported by us are from a survey of gallbladder pathology during the first eight years that Mount Carmel Mercy Hospital has been in existence.

Only the stomach, colon, rectum and esophagus are commoner sites of cancer in the gastrointestinal tract than the gallbladder. It is possible that fifty years ago, cancer of the gallbladder may have been more frequent, since fewer patients were operated on for cholelithiasis. Confirmation of this hypothesis may be gained from a paper of W. J. Mayo in 1902 when he reported a 5 per cent incidence in a series of 405 gallbladder operations. From 1907 to 1940, Vadhiem, Gray and Dockerty of the Mayo Foundation report 291 cases of primary carcinoma of the gallbladder in 33,500 biliary tract operations, resulting in an 0.87 incidence. In addition, pathologic examination at the present time may be more exact and thus many cases may be eliminated which were formerly accepted as primary carcinoma of the gallbladder.

The etiology of cancer of the gallbladder is not clear. Ewing suggests the following factors:

a. Mechanical irritation of calculi.
b. Inflammation that excites cellular hyperplasia.
c. Relation to cholesterol metabolism.
d. Irritative and digestive action of bile.

The relationship of cholelithiasis to carcinoma deserves special attention. Until recently, proof that carcinoma of the gallbladder may result from calculi had not been substantiated. However, in 1947, Petrov and Krotkina presented conclusive experimental proof that sterile, hard, foreign bodies may produce primary carcinoma of the gallbladder. These investigators introduced either sterile

glass tubes or glass tubes with radium into the gallbladders of guinea pigs. One hundred animals were used in the experiment and 51 lived fourteen months or longer. Of the latter group, 5 animals developed carcinoma of the gallbladder after fourteen to thirty-nine months, 4 showing distant metastases. In passing, it should be noted that spontaneous adenocarcinoma of the gallbladder has not been reported in guinea pigs. We feel that this study is particularly significant, although there may be other unknown carcinogenic factors. From this evidence and other studies that incriminate gallstones as a causative factor, prophylactic cholecystectomy for calculi is strongly advocated, particularly in women. The emphasis given by Finney and Johnson for the early removal of the calculous gallbladder is entirely warranted.

Whether papillomatous changes in the gallbladder are significant lesions in the development of carcinoma is a debatable subject. Careful pathologic examination of extirpated gallbladders reveals approximately 1 per cent incidence at our hospital. No cases of malignant degeneration of a papilloma have been observed in our laboratory.

Age

Carcinoma of the gallbladder is a disease most commonly seen in the sixth decade of life. Eleven of our patients (57 per cent) were in this age group. The youngest patient was 47 and the oldest 77 years of age. Table 3 indicates the age distribution.

TABLE 3

Age	*No. of Cases*
45-50 years	1
51-55 years	1
56-60 years	3
61-65 years	5
66-70 years	6
71-75 years	2
76-80 years	1
Total	19 cases

Sex

Carcinoma of the gallbladder affects the female more commonly than the male. In our series, 14 patients (74 per cent) were women and 5 patients (26 per cent) males, a ratio of approximately 3:1. In the literature, ratios of 4 or 5:1 are frequently given. Probably the higher incidence of cholecystitis and cholelithiasis in the female

patient accounts for this higher ratio of females to males. Table 4 illustrates the sex distribution.

TABLE 4

Sex	*No. of Cases*
Females	14
Males	5
Total	19 cases

Cholelithiasis

Sixteen patients (84 per cent) had calculi in the gallbladder. In the literature, the figures vary considerably, and the following may be given as representative:

TABLE 5

	Percentage with Calculi
Miller	36
Judd and Gray	65
Illingworth	65
Boyce and McFetridge	73
Vadhiem, Gray and Dockerty	88
Siegert	95
Janowski	100
Gariepy and Gardner	84

Cholecystitis is invariably present. The hypothesis that chronic local irritation predisposes to cancerous changes is borne out in a review of our cases. The presence of stones may produce a proliferation of the mucosa and if the process is uncontrolled, a neoplasm results.

Pathology

The pathologic anatomy of carcinoma of the gallbladder may be conveniently divided into 4 groups:

TABLE 6

Types	*Percentage*
a. Papillary adenocarcinoma	58
b. Scirrhous adenocarcinoma	42
c. Colloid adenocarcinoma	10
d. Squamous cell carcinoma	5

A definite distinction between the first three types is somewhat

artificial, since more than one type of structure may be found in any given case. If the papillary carcinomas showing considerable infiltration of the wall are included in the scirrhous malignancy, the latter is considerably more commonly encountered than indicated above. The fundus of the gallbladder is the primary site of origin in approximately 75 per cent of carcinomas and the infundibulum in approximately 25 per cent.

Grossly, the papillary type of tumor produces an encephaloid, bulky tumor nearly filling the gallbladder. The structure is commonly enlarged three to four times normal size. In many cases it is nearly impossible to determine the site of origin anatomically in the gallbladder itself. A few of these tumors undergo mucinous changes in which a thick tenacious, jelly-like material may be easily scraped from the cut surfaces. The scirrhous type of neoplasm is associated with a moderate to marked desmoplastic reaction producing a thickening of the gallbladder wall. The squamous cell carcinoma is indeed rare. Only one case was found in our series. Grossly, the characteristics are similar to that noted in the scirrhous type.

Microscopically, two distinct varieties are seen, that is, adenocarcinoma and squamous cell carcinoma. The adenomatous tumors may present a papillary, scirrhous or colloid form. The latter contains numerous "signet ring" cells and a moderate amount of mucus. Apparently, the squamous cell variety represents a definite metaplasia from the mucosal epithelium and may be more correctly designated as an adeno-acanthoma.

The mode of spread is worthy of attention. By direct extension, it may invade the hepatic parenchyma, the extrahepatic ducts, stomach and duodenum. The colloid form may produce numerous peritoneal and omental implants throughout the upper abdomen. Intravascular spread occurs through the venous drainage of the gallbladder directly into the liver by way of the portal circulation. The cystic veins drain into the portal vein. By the lymphatic system, the cystic, periportal, pancreatic and retroperitoneal lymph nodes are involved in the order indicated. Distant metastases are rare.

Clinical Aspects

The onset of this disease is insidious, and the clinical syndromes presented are varied. The correct diagnosis was not made preoperatively in any of our cases. Naturally, the clinical picture depends upon the location of the lesion, duration of the neoplastic process, the degree of malignancy, and the presence or absence of

metastases, etc., so that a typical syndrome is not seen. However, in a review of our cases, the following information was found:

TABLE 7

Chief Complaint	*No. of Cases*
RUQ pain	16
Jaundice	1
Vomiting	1
Drainage from RUQ wound	1
Total	19 cases

TABLE 8

Weight Loss

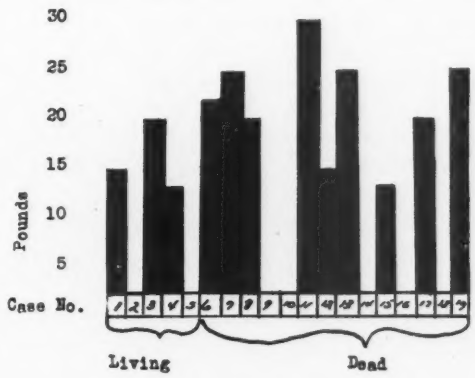

TABLE 9

Duration of Present Illness

a. Varied from 1 week to 25 years
b. Average duration—6 months.

TABLE 10

Significant Facts

Tenderness in RUQ	18 cases
Icterus	13 cases
Weight loss	11 cases
Nausea and vomiting	14 cases
Palpable mass	9 cases

Varying degrees of icterus were present in 13 (69 per cent) of our cases. The icteric index ranged from 8 to 20 units in the ma-

jority of instances. Ascites or peripheral edema was not recorded in any case. The terminal symptoms of cachexia and hemorrhage are related to extensive hepatic involvement. On examining a few of our patients preoperatively, we were impressed by the fact that we were dealing with a primary tumor of the head of the pancreas. However, in the majority of instances, a diagnosis of chronic cholecystitis and cholelithiasis was given.

Diagnosis

As previously indicated, the diagnosis of carcinoma of the gallbladder is extremely difficult and rarely suspected. Unfortunately, laboratory tests are not pathognomonic. Except in confirming the diagnosis of a non-filling, non-functioning pathologic gallbladder, cholecystography is of little value. Of course, gallstones are commonly demonstrated. Thus, the failure to diagnose the cancerous disease prior to operation is not remarkable. These cases are usually diagnosed as cholelithiasis. However, in the differential diagnosis, one must consider carcinoma of the head of the pancreas, diverticula of the second portion of the duodenum, carcinoma of the duodenum and hepatic vessels. Peritoneoscopy is not of value in the early or late diagnosis of carcinoma of the gallbladder.

Treatment and Results

Regardless of the primary site of a neoplasm in the gastrointestinal tract, the control of cancer can be achieved only by exhaustive clinical investigation followed by early removal of the tumor while it is still more or less local. Early recognition of the signs and symptoms of cancer so that potential patients may seek aid before it is too late is mandatory. Prompt and adequate treatment must follow. In carcinoma of the pancreas, preoperative diagnosis of early or moderately advanced lesions is nearly impossible. Therefore, a prophylactic approach is essential. Surgical removal of the gallbladder in cases with calculi is indicated.

In our series of cases, 13 were treated by cholecystectomy with or without the removal of the adjacent hepatic beds, 5 were treated by cholecystotomy for drainage, and one advanced neoplastic process was treated by a gastroenterostomy. The results of these surgical procedures are indicated below.

Three patients moved to other parts of the country and follow-up was impossible. Of the operated patients who are still alive, Cases 3 and 5 were operated for an acute gangrenous cholecystitis. A cholecystotomy was performed with biopsy, and after a diagnosis of primary carcinoma was given, a cholecystectomy was performed

TABLE 11

Case No.	*Living*
1	18 months following surgery
2	2 years " "
3	3 years " "
4	7 years " "
5	7 years " "

within one week. The cancerous diagnosis was substantiated in the excised gallbladder. In this group of cases, no metastases or extension into the liver were found. Cystic or portal lymph nodes were involved in 3 cases and apparently the neoplastic glands were completely removed.

TABLE 12

Case No.	*Mortality*
*6	3 days following surgery
*7	3 weeks " "
8	1 month " "
*9	1 month " "
10	6 weeks " "
*11	3 months " "
12	6 months " "
*13	8 months " "
14	12 months " "
15	15 months " "
16	3 years " "

*Liver metastasis at operation.

The study of primary carcinoma of the gallbladder is not a pleasant one and there is very little evidence to suggest any improvement in the treatment except for early diagnosis. However, we do not share the hopelessness of many writers, inasmuch as 26 per cent of our patients are alive and apparently well from one and a half to seven years following cholecystectomy. We are convinced in reviewing the literature and our cases that all gallbladders containing calculi should be removed if they create symptoms to cause the patient to seek medical attention.

Summary

1. Nineteen cases of primary carcinoma of the gallbladder are presented in this study.

2. Cholelithiasis is the most important single factor in the etiology of primary carcinoma of the gallbladder.

3. The signs and symptoms are not characteristic, but the elicitation of a slight or moderate weight loss is a significant factor.

4. Prophylactic removal of gallbladders harboring stones is imperative.

REFERENCES

1. Boyce, F. F., and McFetridge, E. M.: Carcinoma of the Gallbladder, Internat. S. Digest, *21:*67-69 (Feb.) 1936.
2. Erdmann, J. F.: Malignancy of the Gallbladder, Ann. Surg. *101:*1139-1143 (May) 1935.
3. Finney, J. M. T., Jr., and Johnson, M. L.: Primary Carcinoma of the Gallbladder, Ann. Surg. *121:*425-434 (April) 1945.
4. Hochberg, L. A., and Kogut, B.: Primary Carcinoma of the Gall-Bladder, Am. J. Surg. *43:*746-753 (March) 1939.
5. Illingworth, C. F. W.: Carcinoma of the Gall-Bladder, Brit. J. Surg. *23:*4-13 (July) 1935.
6. Jankelson, I. R.: Clinical Aspects of Primary Carcinoma of the Gallbladder, New England J. Med. *217:*85-88 (July 15) 1937.
7. Janowski, W.: Ueber Veränderungen in der Gallenblase bei Vorhandensein von Gallensteinen, Beitr. z. path. Anat. u. z. allg. Path. *10:*449-480, 1891.
8. Judd, E. S., and Gray, H. K.: Carcinoma of the Gall Bladder and Bile Ducts, Surg., Gynec. & Obst. *55:*308-315 (Sept.) 1932.
9. Kirschbaum, Jack D., and Kozoll, D. D.: Carcinoma of the Gallbladder and Extrahepatic Bile Ducts, Surg., Gynec. & Obst. *73:*740 (Nov.) 1941.
10. MacCarty, W. C.: The Pathology of the Gall-bladder and Some Associated Lesions, Ann. Surg., *51:*651-669 (May) 1910.
11. Magoun, J. A. H., Jr., and Renshaw, K.: Malignant Neoplasia in the Gall-bladder, Ann. Surg. *74:*700-720 (Dec.) 1921.
12. Mayo, W. J.: Malignant Disease Involving the Gall-bladder, Med. News *81:*1105-1107 (Dec. 13) 1902.
13. Miller, R. H.: Primary Carcinoma of the Gallbladder and Bile Ducts, Boston M. & S. J. *191:*1074-1077 (Dec. 4) 1924.
14. Siegert, F.: Zur Astologie des primären Carcinomas der Gallenblase, Arch. f. path. Anat. u. Physiol. *132:*353-368, 1893.
15. Vadhiem, J. L.; Gray, H. K., and Dockerty, M. B.: Carcinoma of the Gallbladder, Am. J. Surg. *63:*173-181, 1944.
16. Weiss, S.: Clinical Lectures on the Gall Bladder and Bile Ducts, Year Book Publishers, 1944.

THE CONSERVATIVE AND SURGICAL MANAGEMENT OF ESOPHAGEAL OBSTRUCTION

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PATIENTS suffering from esophageal obstruction are seen with increasing frequency by the internists, esophagoscopists and thoracic surgeons. For many years these unfortunate individuals were treated with indifferent success. In recent years, however, the wonderful changes brought about through vitamin therapy in dietary diseases by the internist, the increasing use of the esophagoscope, and the revolutionary developments in thoracic surgery have established tremendous progress in the treatment of esophageal lesions.

AVITAMINOSIS

The care of individuals with comparatively simple benign lesions, such as those seen in the routine case of avitaminosis, is not at all difficult. Pellagra, though a reportedly ancient disease, is present in a large number of patients today. It is a disease which attacks all strata of society, all races, and both sexes. This disease frequently causes severe hyperemia, dryness and occasional ulceration of the oral and esophageal mucosa. The inclusion of large amounts of all the essential vitamins in the diet of these persons suffering from severe vitamin deficiency will produce cessation of symptoms and restore the individual to health in a relatively short time. In 1944 one of the authors presented a report[1] of esophageal manifestations of pellagra in 17 individuals suffering from that disease. The chief complaints of these persons were anorexia, burning sensation of the tongue, abdominal pain and dysphagia. The discomfort on swallowing became so intense in 12 of these patients that they could not take any solid food whatsoever when first seen in consultation. Seven experienced extreme discomfort when they swallowed liquids. Esophagoscopic examination of these persons presented an intensely hyperemic esophageal mucosa in which multiple tiny ulcerations were noted in several of the patients. A barium study of the esophagus in 8 of the cases presented many small constricted areas along the course of the esophagus. These constrictions occurred in areas where ulcerations were seen on esophagoscopy. No tumor or for-

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Read before the sixteenth annual Postgraduate Surgical Assembly of The Southeastern Surgical Congress, Hollywood, Fla., April 5-8, 1948.

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eign body was found in any of the cases. These patients were all given very large doses of nicotinic acid amide, thiamine chloride and riboflavin daily for 3 months. A cessation of their symptoms was produced in from 3 to 8 weeks in all of the cases. This type of esophageal obstruction and dysphagia has rapidly disappeared with the great increase in multiple vitamin therapy during the past few years.

Benign Web of the Esophagus

Patients may be seen complaining of difficulty in swallowing, referred to the upper opening of the esophagus, extending over several years, sometimes with no apparent reason for the trouble.

Fig. 1. (Case 1.) Barium study reveals pooling of barium at esophageal orifice due to a benign web.

Direct inspection of the esophageal orifice may reveal a constriction due to a web of varying consistency—some are firm and dense, while others are thin and friable. The treatment is usually simple and effective. The web may be obliterated merely by introducing the esophagoscope, or may be dilated by the use of bougies or, as Jackson has recommended, the use of alligator forceps passed through the area closed and removed with the jaws open. This treatment is effective at once and is usually permanent.

CASE 1. M. L. G., white female, aged 39. Patient had had difficulty for past 3 months in swallowing solid diet and had recently regurgitated considerable amount of liquid diet. Barium study revealed a pooling of barium at the esophageal orifice and retention at that point for some time before it passed through the esophagus. Esophagoscope was passed on Jan. 29, 1948, and a thin fibrous web was found at the esophageal orifice. The scope was passed through this web without difficulty. Below the web no abnormality was found in the esophageal mucosa. The web was dilated with size 40F rubber mercury filled dilator. She was dilated again on February 11 and March 25 and has had no difficulty whatsoever in swallowing since the first dilatation.

ACHALASIA OR CARDIOSPASM

Achalasia or cardiospasm is a type of esophageal obstruction which in the past has been treated almost solely by the use of repeated dilatations of the spastic area at the distal end of the esophagus. It is generally agreed that these patients should receive a fair trial with dilatations. In those patients who continue to have obstruction and increasing weight loss, surgical intervention has been found to be necessary to prevent serious malnutrition and ultimate starvation. The persons suffering from this disease frequently complain of retrosternal pain, or so called "heart burn," which is brought about by a severe esophagitis produced by fermentation of retained food within a greatly dilated esophagus. The etiology of this disease is not well understood, but has been thought by some to be due to fibrosis of the periesophageal connective tissue and of the musculature of the esophagus. This is caused by infection. Dr. Harris P. Mosher of Boston, who has made a special study of the etiology of obstructive lesions at the lower end of the esophagus, believes that infection of the esophagus can originate within or without the esophagus or from the blood stream by an infectious thrombophlebitis. Others feel that the disease is due to a fibrosis of Auerbach's plexus with a consequent loss of ganglion cells which produces the so-called cardiospasm. The usual method of treatment in our department at the Medical College of Alabama is, first, to examine the patient esophagoscopically to make sure the obstruction is not due to neoplasm, following which, we dilate the esophagus using the Edwin N. Broyles type of esophageal dilator to try to determine the degree of spasticity at the lower end of the esophagus. If this dilator passes with little resistance up to size 32F., we then use a rubber mercury filled dilator, as tolerated, up to size 50F. In the more persistent cases we use a mercury filled bougie which has a rubber balloon attached around its lower circumference. The dilator is passed through the spastic area and the balloon inflated in order to dilate the spastic area as much as possible. If this treatment does not alleviate the patient's distressing symptoms in a relatively short time, and the patient does not choose to continue

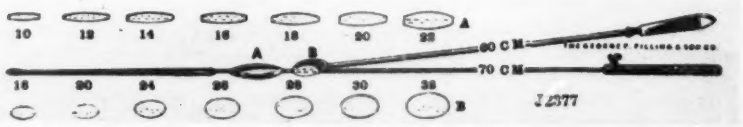

Fig. 2. Esophageal Dilator Set, Broyles. A 70 cm. guide rod terminating in a permanently fixed No. 9 Fr. flexible bougie and a second rod, 60 cm., having seven (7) different size removable bulbs (16 to 32 Fr.). After flexible end has been passed, the bulbs of desired size are threaded on to the 70 cm. guide and are pushed through the stenotic area by the 60 cm. dilator, to which has been screwed one of the bulbs. After a larger lumen has been established the bulb on the dilator may be changed to the desired size.

J 2377 Esophageal Dilators, Broyles, set of 2 rods and 14 bulbs. . . . Link.

Courtesy of The George P. Pilling & Son Company

with the dilatations, a transabdominal esophagogastrostomy based on the principle of the Finney pyloroplasty is recommended. This procedure has proved to be highly satisfactory and has produced an apparent cure of this disease in a very high percentage of the cases thus treated.

Case 2. G. B., colored male, aged 26, was first seen on Jan. 23, 1948, with the chief complaint of having been unable to swallow any solid food for 3 months. He had lost 40 or 50 pounds in weight and had been repeatedly regur-

Fig. 3. (Case 2.) Barium study of esophagus showing very marked dilatation of esophagus prior to esophagogastrostomy.

gitating food that had been swallowed 24 to 48 hours previously. Barium study of the esophagus revealed a marked dilatation of the esophagus measuring 10 cm. in diameter at the level of the diaphragm. On January 26, under local anes-

Fig. 4. (Case 2.) Barium study of esophagus following transabdominal esophagogastrostomy.

thetic, a 9 mm. esophagoscope was passed. More than two quarts of fluid and partially disintegrated food was aspirated from the esophagus. The mucosa of the lower half of the esophagus was tremendously engorged and hyperemic. A spasm at the diaphragm would not allow the passage of a 9 mm. scope into the stomach but would allow a 7 mm. scope to pass. On the 27th a transabdominal esophagogastrostomy was performed by Dr. J. M. Mason III. Patient was given two transfusions, a high caloric, high vitamin diet and was eating without difficulty when discharged on February 25.

Lye Burns

Lye burns of the esophagus can produce extremely severe and distressing obstruction. The ingestion of lye causes burns of the oral and esophageal mucosa of varying intensity. When the ingested lye is quickly expectorated a burn of the lips and oral mucosa may be all that will result. However, when this caustic is swallowed, a burn of the entire esophageal circumference at varying levels, as well as of portions of the gastric mucosa, may take place. These burns of marked intensity cause prolonged morbidity and frequently call for heroic surgical intervention.

Immediately after a patient, who has accidentally or intentionally swallowed lye, presents himself in our emergency room, the patient is given a mouth wash of dilute acetic acid, followed by a mouth wash of a bland oil. A nasal feeding tube is then inserted down the esophagus into the stomach and the stomach washed with dilute acetic acid and water. A bland oil is then instilled into the stomach.

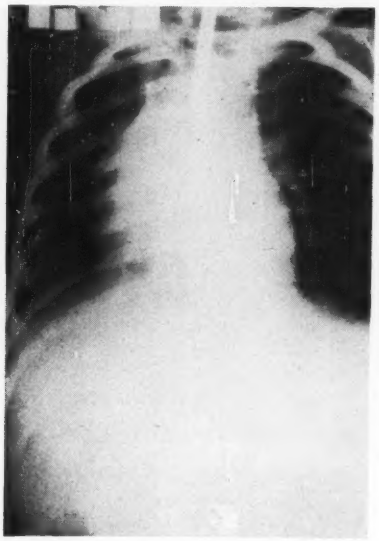

Fig. 5. Demonstrates our rubber, mercury filled esophageal dilator.

The tube is left in place for 3 days so that a high-caloric, high-vitamin diet may be given. On the fourth day the patient is esophagoscoped to determine the damage produced in the esophageal mucosa. If only small areas of the esophageal mucosa are burned, the patient is started on daily dilatations of the esophagus using a rubber mercury filled bougie. The size of the bougie used depends upon the size and age of the patient. If the patient is a child a size 22F. to 26F. is used. If an adult, size 40F. is used. After 10 or 12 dilatations these patients usually need no further treatment.

In those unfortunate individuals where a deep burn of the entire circumference of the mucosa is produced, daily dilatations are begun at once using the Edwin N. Broyles type of esophageal dilator, as tolerated. These olive-shaped metal dilators vary in size from 12F. up to size 32F. If dilatation can be carried out in this latter group successfully at the beginning, the patient can be placed on a liquid or

semisolid diet at once. A very large percentage of these patients can be thus treated successfully in this manner if the dilatations can be done daily for at least 2 weeks and the patients kept under observation to make sure that they are getting adequate caloric and fluid intake and that swallowing is unimpaired. Secondary infection which may develop must be treated chemotherapeutically.

Our greatest difficulty arises in those patients who are not seen in the clinic until several days after the lye burn has occurred. These individuals present a most pathetic picture in that they are usually unable to swallow any soft or liquid food, are markedly dehydrated, temperature elevated and they will complain of varying degrees of pain on swallowing. The constriction in the burned area may be so intense that only the small flexible tip of the Broyles dilator can be passed. Such a patient will have to be dilated daily or every other day, always endeavoring to pass the largest possible dilator without stretching the burned area more than it will tolerate. We have seen patients who could be dilated easily and successfully from size 14F. up to 24F. in a few days. This size can then be maintained only by frequent dilations over the course of at least one month. Following this the dilations will usually have to be carried out bimonthly for an indefinite period.

It is at this stage of the care of a lye burn of the esophagus that we are so frequently handicapped and given great concern as a patient may be discharged from the clinic and told to return twice monthly for dilatations but will not return for 2 or 3 months. When he returns, following this prolonged absence, he may have such a marked constriction of the burned area that a complete stenosis may have taken place. It is then necessary to perform a gastrostomy and treat the patient for dehydration and emaciation, following which, when he has been restored to such a condition as to be considered a good surgical risk, it has been found necessary in some cases to perform an intrathoracic esophagogastrostomy and elevate the stomach above the stenotic area.

CASE 3. L. N., colored male, aged 46, was admitted to the hospital on Jan. 24, 1947, with the history of having swallowed lye 4 weeks previously. Barium study of the esophagus revealed almost complete obstruction of the cervical esophagus. A gastrostomy was performed on January 31. Attempts at dilatation were unsuccessful. On March 26 Dr. J. M. Mason III exposed the cervical esophagus through an incision on the left side of the neck. The strictured area, measuring 3 cm. in length, was incised longitudinally, a nasal tube was passed into the esophagus through the stricture, and into the stomach, where the distal end was brought out through the gastrostomy opening. A string was attached to the lower end of the nasal tube and was pulled through the strictured area and out of the mouth. The tube was then removed and a bougie was placed within the strictured area and anchored by a string attached

Fig. 6. (Case 3.) Barium study of esophagus reveals complete obstruction in the cervical esophagus prior to operation.

Fig. 7. (Case 3.) Postoperative wound completely healed.

Fig. 8. (Case 3.) Barium study of esophagus postoperatively. Patient swallowing soft diet with no difficulty.

to each end. The wound was closed in two layers over the bougie. Gentle traction on the string gave early motion to the bougie and prevented the formation of adhesions in the divided strictured area. The wound healed without difficulty and the bougie was removed. Dilatations were carried out daily with a size 26F. Broyles dilator. He was discharged on May 2 swallowing without difficulty and had gained 31 pounds in weight.

(This case report was presented by Dr. J. M. Mason III at the December, 1947, meeting of the Southern Surgical Association and is in the process of publication.)

CASE 4. G. G., colored female, aged 9, was admitted to the hospital on Jan. 25, 1943, with a history of having swallowed lye 4 hours prior to admission. Her mouth was washed with dilute acetic acid and this was followed with a bland oil. A nasal feeding tube was inserted and removed on January 30. She was dilated satisfactorily and sent home with instructions to return

Fig. 9. (Case 4.) Barium study reveals complete obstruction of the esophageal lumen prior to operation.

Fig. 10. (Case 4.) Barium study following transthoracic esophagogastrostomy reveals splendid, widely open, anastomosis.

weekly for dilatation. She did not return until 4 months after her discharge from the hospital, at which time our smallest dilator could not be passed through the stricture which was located in the upper third of the esophagus, although barium would pass through in a tiny stream. On May 12 a gastrostomy was performed. The patient left the hospital in good condition on a gastrostomy but did not return again until Dec. 21, 1946, at which time barium revealed a complete stricture in the upper third of the esophagus. No dilator could be passed through this strictured area. She returned on Jan. 6,

1947, and was given a high caloric, high vitamin diet through her gastrostomy tube and on January 12 an intrathoracic esophagogastrostomy was performed by Dr. Charles Donald of Birmingham, Alabama. The patient left the hospital 15 days after this operation swallowing freely through her newly formed esophagogastrostomy opening. Eight days later she was returned to the hospital and a foreign body of chewing gum was removed from above the esophagogastrostomy orifice. She was discharged in 2 days and has had no further difficulty whatsoever until the present time.

Idiopathic Stenoses

Congenital malformation of the esophagus or idiopathic stricture will frequently cause an obstruction of the esophagus of such degree as to require periodic dilatation of the stenosed area. These malformations are usually found at the junction of the middle and lower thirds of the esophagus. There will be no accompanying history of trauma or the swallowing of any caustic substance. The only history given by these persons will be that they have had the gradual onset of difficulty in swallowing. They can be dilated with increasingly large dilators daily for one week, and then swallow a normal diet for perhaps a 3 month period, when the difficulty in swallowing will begin all over again. Thus if these persons can be dilated daily for one week at approximately 3 month intervals, they can usually maintain an adequate state of nutrition.

Case 5. B. W., white female, aged 43. Patient had had periodic difficulty in swallowing since she was a small child. There is no history of any trauma or of having swallowed a foreign body or caustic. This difficulty comes on gradually so that she is ultimately unable to swallow solid foods and has to resort to soft foods. Following this she resorts to liquids until the esophagus is dilated. Esophagoscopy on July 27, 1945, revealed a strictured area through which a size 22F. dilator would pass. The patient was dilated daily for a week with sizes 28F., 30F., and 32F., then had no further difficulty in swallowing for 3 months, at which time the dysphagia began all over again. She has been seen every 3 months since the original consultation and dilated on those visits daily for one week. This seems to take care of the inability to swallow through the strictured area for that length of time.

Neoplasms

The type of esophageal obstruction which gives us our greatest concern is that produced by malignant neoplasms of the esophagus. All patients complaining of esophageal obstruction in which there is no definite history of the swallowing of a foreign body, the ingestion of lye, or without the clinical manifestations of avitaminosis or achalasia should have a barium study of the esophagus at once. This will usually give one considerable information as to the cause of the obstruction. When these x-rays have been studied, the patient should have an esophagoscopic examination. If a new growth is

encountered upon esophagoscopy, biopsy specimen should be obtained, if possible, and studied microscopically. A malignant neoplasm thus found, at an early stage in its development, can be treated by intrathoracic resection of the involved area and an esophagogastrostomy carried out successfully.

Congenital Short Esophagus

Congenital short esophagus is probably much more common than reports in the literature would lead us to believe. Opinions differ as to the development of this anomaly, but most observers believe

Fig. 11. Preoperative barium study of esophagus in a patient with congenitally short esophagus.

that hypoplasia of the esophagus in early embryonic life causes an elevation of the stomach into the thorax. Dysphagia and regurgitation are the two most common symptoms early in the course of the disease, due to a narrowing at the esophagogastric junction. This narrowing will cause a marked retention of food, with the production of rather severe esophagitis. Ulceration may take place, from which hemorrhage may occur. We have recently seen an adult white male who came to us shortly after he had experienced a severe hemorrhage. The hemorrhage had been preceded by many months of dysphagia. Esophagoscopy revealed a funnel-like narrowing at the lower end of the esophagus and a marked degree of esophagitis.

An ulcer was found just above the stenosed lower end of the esophagus, which we feel sure was the site of the hemorrhage. This area bled freely on manipulation and biopsy studies of tissue taken for microscopic study revealed gastric mucosa in the presence of acute and chronic inflammation. An intrathoracic esophagogastrostomy, performed by Dr. Charles Donald, of Birmingham, Alabama, has produced an apparent cure.

In conclusion we would like to leave the impression that these obstructing lesions of the esophagus warrant our most careful study, untiring care, and surgical intervention when indicated.

BIBLIOGRAPHY

1. Fisher, G. E.: The Esophageal Manifestations of Pellagra, South. M. J. *37:*445-448 (Aug.) 1944.
2. Clerf, L. H., and Manges, W. F.: The Congenitally Short Esophagus, J.A.M.A. *102:*2008, 1934.
3. Mosher, H. P.: Infection as a Cause of Fibrosis of the Esophagus, Ann. Otol., Rhin. & Laryng. *50:*633-661 (Sept.) 1941.

PLACENTA PREVIA

With Report of Two Cases

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PLACENTA PREVIA is one of the most formidable complications of pregnancy and all obstetricians must be prepared to care properly for this unavoidable hemorrhage.

Three varieties are distinguished, depending on the site of implantation. *Marginalis:* with only the placental margin at the internal os; *Lateralis,* with the placenta partially occluding the internal os; and *Centralis,* with the placenta implanted directly over the internal os. DeLee[1] states that the lower edge of a normally implanted placenta is at least 10 cm. from the internal os.

INCIDENCE

Stander[2] reported an incidence of one case in 206 labors at New York Lying-In Hospital, while various authors report one in 98 to one in 300 labors. The experience in this hospital is 2 cases in 233 labors over the past 2 years. Needless to say, the frequency is great enough to call for our careful consideration.

ETIOLOGY

Multiparity is an important etiologic consideration. This is especially true if the pregnancies have occurred at close intervals. Previous endometriotis is also thought to be a causative factor. The incidence is highest between the ages of 25 and 35 years; of course this gives us more multiparae.

SYMPTOMS

Hemorrhage in the last trimester, usually in the eighth month, is characteristic. The first bleeding may vary from a few drops to profuse flooding. The hemorrhage usually recurs and increases in amount, but at times, there is a small continuous flow. Pain, pressure, or throbbing in the lower abdomen may occur, as well as frequent urination.

DIAGNOSIS

In case of suspected placenta previa, matched blood should be on hand; the patient and operating room prepared for vaginal and abdominal procedure. A sterile vaginal examination will usually

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disclose sponge-like placental tissue lying between the finger and the presenting part. If the cervix is not patulous, it should not be dilated, but the patient watched for developments and the examination repeated.

Snow[3] and others have described roentgen diagnosis of the placental site. It is to be hoped that this method will become more widely used.

Prognosis

Davis and Campbell[4] state that placenta previa is responsible for 20 per cent of the maternal deaths in the United States. Older statistics for expectant treatment give the maternal death rates as 36 to 40 per cent; the fetal death rate as 66 per cent. Recent (1932 to 1943) rates for New York Lying-In Hospital are maternal 0.64 per cent and fetal, 25.1 per cent.

Treatment

Adequate blood transfusions and treatment of shock are the first consideration. Penicillin and sulfanomides are valuable in counteracting infection induced by manipulations or encouraged by the weakened condition of the patient.

Marginal and lateral placenta previa may be treated by rupture of the membranes and scalp traction. If the cervix is long and uneffaced, or the pelvis contracted, these cases should be treated by Cesarean section. Central placenta previa is best treated by Cesarean section. It is believed that this offers the best chance for life to the mother and the baby. Recent writers mention treatment by tamponade, Vorhees bag and Braxton-Hicks' version, in condemnation. Tiffany J. Williams[5] recently published an excellent paper on the expectant treatment of placenta previa.

Report of Cases

Case 1. Mrs. H. S., aged 25, 8 months pregnant, was admitted May 5, 1946, with the chief complaint of vaginal bleeding which had started the previous night. She had received no prenatal care.

Physical examination revealed a well developed, well nourished, Navajo multipara in moderate shock. The skin and mucosae were pale, the heart was rapid but regular, the abdominal enlargement was nearly that of full term, fetal motion was felt, irregular uterine contractions and excessive vaginal bleeding were present.

The blood pressure, unfortunately, was not recorded. Temperature was 98.8 F., pulse 120 and respiration 24. No laboratory facilities were available.

Previous hospital records show influenza in 1943 and gastroenteritis in 1945. Her previous children had been born without medical attendance.

TREATMENT AND COURSE: Liquid diet with forced fluids was given, Coagulen 10 c.c. intramuscularly, codein sulphate gr. ½ by hypodermic, and nembutal gr. 1½ by mouth were given. Blood plasma and donors were unavailable. A perineal prep was done and the patient placed on the delivery table. One and a half hours after admission, a large amount of blood, some clots and pieces of placenta were passed. The pains became of 45 seconds' duration and one minute apart. Sterile vaginal examination disclosed placental tissue at the internal os and poor engagement of the head. The pulse became very weak, the respiration shallow, so 1 c.c. adrenalin chloride 1-1000 was given by intracardiac injection. She failed to rally and expired two hours and forty-five minutes after admission. Permission for autopsy was refused.

CASE 2. Mrs. P. F., para IX, aged 43, 8 months pregnant, was admitted Aug. 11, 1947, with the chief complaint of vaginal bleeding off and on for the past month, but worse the previous night. No bleeding was present on admission, but she was pale and weak, temperature 98.2 F., pulse 96, respiration 22, blood pressure 118/70, urine negative, Wassermann negative. The writer did not see her at this time, and no blood studies were done. She was given Vitamin K 1 c.c. intramuscularly every 4 hours for 2 days and the bleeding only amounted to slight staining of the pad. After a week in the hospital, she was allowed to go home.

Previous hospital records show in 1941, accidental abortion of a two months pregnancy, normal parturition in 1942 and 1944, and tonsillectomy in 1945. She has 8 children living and well. Her general health had been good.

On Sept. 12, 1947, she was readmitted with profuse vaginal bleeding which had started an hour and a half previously at 3:00 a.m.

Physical examination revealed a well developed, well nourished Navajo multipara in shock. The skin was pale, cold and clammy and the mucosae pale. The heart was very rapid and weak, but regular. The abdominal enlargement was that of full term pregnancy, fetal heart tones could not be heard. Vaginal bleeding was present.

The blood pressure could not be read, the temperature was 98.6 F., pulse 140, respiration 28. There were 1,800,000 red blood cells, hemoglobin 35 per cent (Dare), Blood Type A. A catheterized urine specimen showed 3 plus albumen and a trace of sugar.

Vitamin K, 2 c.c. intramuscularly was given on admission and 1000 c.c. normal saline started subcutaneously. Blood plasma 1000 c.c. and typed blood 1500 c.c. were given. The patient passed several large clots and suffered involuntary bowel action. After transfusion, the blood pressure rose to 90/70 and shock was somewhat alleviated. No vaginal examination was done, because the history and findings indicated the diagnosis.

OPERATION: Ten hours after admission, a classical Cesarean section was done under Novocain 0.5 per cent infiltration anesthesia supplemented by drop ether. No narcotic sedation was employed preoperatively. Transfusion of 500 c.c. typed blood and 500 c.c. plasma was given during the operation. In order to prevent any mishap with the intravenous needle, venesection was done and a canula inserted in the left median cubital vein.

Coramine 1 c.c. was given twice, and 2 c.c. of ergotrate and 2 c.c. pitocin were injected into the uterine wall after delivery. Immediately after the close of the operation, the patient became cyanotic and was given oxygen inhalations for a short period.

FINDINGS: The uterine wall was 1 cm. thick, was somewhat fibrous and bled very little. A small myoma was found at the edge of the uterine incision. The adnexa and other organs were not examined. The amniotic sac contained meconium and the baby appeared to have been dead for some hours. The placenta was centrally located over the cervix, there was no thinning of the lower uterine segment and no dilation of the cervix.

PROCEDURE: Mid-line incision, umbilicus to symphysis; the bladder wall was freed, the uterus incised longitudinally, the baby extracted, cord clamped and cut. The placenta and membranes were removed, the uterus swabbed with gauze. The uterus was closed with one layer plain No. 1 gut and two layers of chromic No. 1 gut, each continuous. The peritoneum was closed with plain No. 1 gut, continuous; the fascia with chromic No. 1 gut interrupted; the skin with medium dermal, interrupted. Two medium dermal retention sutures were placed through the fascia and tied over gauze packs. The small myoma was excised.

HEMORRHAGE: Slight. SHOCK: No increase.

PATHOLOGICAL REPORT
National Institute of Health
Bethesda, Maryland

September 24, 1947

Diagnosis: Submucous leiomyomata with decidual reaction.
Gross: Specimen submitted consists of a round piece of tissue 3 x 2 x 1 cm. Surface is white and slightly nodular. Cut section discloses moderately firm, white-gray whorled tissue.

Microscopic: There is a rather well circumscribed group of smooth muscle cells which are growing in a whorl like fashion. Covering this small nodule there is a moderate to marked amount of large pale staining irregular cells which resemble decidual cells. No mitotic figures can be seen. There is no evidence of any malignancy.

Signed: R. D. Lillie, Medical Director
Chief, Pathology Laboratory

POSTOPERATIVE TREATMENT AND COURSE: During the next 2 days 100,000 units of penicillin was given in 1000 c.c. 5 per cent dextrose in normal saline alternated with 100,000 units penicillin in 1000 c.c. 5 per cent dextrose in distilled water every 8 hours by continuous intravenous drip. On the third postoperative day, 500 c.c. of typed blood was given and the intravenous cannula removed. Water was given by mouth after recovery from ether, surgical fluids were started the next day. Soft, high protein diet was started the fourth day, and general diet on the eighth day. Ferrous sulphate and liver extract capsules were started the fourth day and continued for 3 weeks. Crude liver extract intramuscularly was given for 10 days.

The immediate postoperative condition was fair: Temperature 100 F., pulse 102, respiration 22. The next morning these were 100 F., 138, 30, and the blood pressure 130/76. Later in the day, these fell to 99 F., 100, 22, and remained in normal range until the fourth day, when the temperature was 101 F., pulse 120, respiration 24, blood pressure 116/70. These dropped to

normal range the fifth day and remained so. On the first night, codein sulphate gr. ½ by hypodermic was given for pain. Normal lochia is recorded during the postoperative period. A large amount of bloody urine was passed 12 hours after operation; bladder function was thereafter normal. A catheterized specimen on the third day showed albumen one plus. On this day the blood count was red blood cells 2,060,000, hemoglobin 45 per cent, white blood cells 11,950, segmentas 90, small lymphocytes 8, eosinophiles 2. A soapsuds enema on the sixth day gave good results. The venesection site became swollen and painful, but was relieved in a few days with hot magnesium sulfate fomentations. The patient was up in a wheel chair on the ninth day. Blood count on the tenth day was red blood cells 3,020,000, hemoglobin 55 per cent, white cells 11,600, segmentas 70, small lymphocytes 29, monocytes 1. The sutures were removed on the twelfth day, the wound being clean and healed. The patient was discharged in good condition on the fourteenth day and has remained well.

COMMENT

These 2 cases exemplify the old and the new in the treatment of placenta previa. They are typical in occurring in multiparae, the second with proved endometrial pathology. The first severe hemorrhage occurred in the eighth month of pregnancy. The second case exemplifies the appearance of repeated small and large hemorrhages and teaches one not to be lulled into a sense of security by cessation of the bleeding. No doubt, in this case, the patient's life was saved by early and adequate transfusions and prompt Cesarean section. Adequate parenteral fluid and penicillin aided in the favorable postoperative course. The 2 cases show the advantage of adequate laboratory and transfusion facilities, a stock of plasma, and present an argument of the necessity for a blood bank. How many lives could be saved if we could always reach into the refrigerator for a flask of blood?

REFERENCES

1. DeLee: Principles and Practice of Obstetrics, 6th Edition, Philadelphia, W. B. Saunders Co., 1933, p. 491.
2. Stander, H. J.: Textbook of Obstetrics Designed for the Use of Students and Practitioners, 3rd Revision, New York, D. Appleton-Century Co., 1945, p. 939.
3. Snow, W., and Rosensohn, M.: Roentgenologic Visualization of the Soft Tissues in Pregnancy, Am. J. Roentgenol. *42:*709-717 (Nov.) 1939.
4. Davis, M. E., and Campbell, A.: The Management of Placenta Previa at Chicago Lying-In Hospital; Review of 325 Cases During 1931 to 1945, Surg., Gynec. & Obst. *83:*777-788 (Dec.) 1946.
5. Williams, T. J.: The Expectant Management of Placenta Previa, Am. J. Obst. *55:*169, 1948.

Opinions expressed in this article are those of the author and do not constitute official statements of the Office of Indian Affairs, U. S. Department of the Interior.

INGUINAL HERNIOPLASTY

An Anatomic Evaluation of Current Methods

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FOR many years inguinal hernioplasty has been one of the first major operations performed by the beginner in a planned surgical training program—the chief reason being the almost universal standardization of hernia operations. For the most part, the procedure introduced by Bassini in 1889, with or without minor modifications, has been the operation utilized for inguinal hernias, indirect or direct, large or small, in the young or old. This operation, or its modifications, is unique in that its technical details are not altered by marked differences in the pathologic conditions that may be encountered. This means, in effect, that a preconceived method is used which often disregards the anatomic variations in individual cases. Such an approach to any condition requiring surgical treatment is fundamentally in error.

There is general agreement among surgeons that the majority of recurrences following herniorraphy take place during the first year, perhaps the first six months, and that by the end of the second year nearly all failures will have become apparent. However, reliable statistics on recurrence are difficult to obtain. The criteria for establishing a diagnosis of recurrence varies among individuals. The types and causes of recurrence are variable, and the figures recorded in the literature are contradictory and confusing. Mair[1] and Edwards,[2] in England, reported recurrence rates of 12 and 17.6 per cent for indirect and direct hernias respectively. Andrews and Bissell[3] observed a recurrence rate of 27 per cent following repair of direct hernia. Because of this high rate of recurrence, they advised against routine operations for direct hernias which are relatively asymptomatic, in the belief that recurrences are potentially more dangerous than the original hernia. Mastin[4] reported only 3 recurrences following repair of 85 direct hernias (3.5 per cent). There is apparently no basis for the widespread belief that direct recurrence is the rule, should recurrence follow an indirect hernioplasty (Table I).

Many surgeons believe that the Bassini operation is inadequate, as evidenced by the numerous reports of modifications of the operation, and new concepts in the treatment of hernia. These modifications, numbering well over a hundred, although concerned with

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TABLE I

*Analysis of Types of Hernia Recurrence**

Author	*Indirect*	*Direct*
Mair (Brit. M. J.)[1]	75	25
Edwards (Brit. J. Surg.)[2]	75	25
Clark and Hashimoto (Surg. Gynec. & Obst.)[11]	25	75
Fallis (Ann. Surg.)[22]	51	49
Patrick (Brit. J. Surg.)[23]	74	26
Ogilvie (Proc. Roy. Soc. Med.)[5]	Rare	Common
Iason (Am. J. Surg.)[6]	——	More Frequent
Brandon (Lancet)[7]	Frequent	Infrequent
Cumberlidge (Proc. Roy. Soc. Med.)[8]	Rare	Frequent

*The type of original hernia was often unknown.

every structure in the inguinal region, deal principally with methods of attaching the so-called "conjoined tendon" to the inguinal ligament. There is little evidence that these modifications have produced any better results than those of the original Bassini procedure. The union of the conjoined tendon to the inguinal ligament —the common denominator of these operations—is undoubtedly a factor influencing recurrence in many instances.

Ogilvie[5] believes the Bassini operation to be a mutilation of beneficent structures when used for early oblique hernias, and that direct recurrence after repair of an indirect hernia is "an incisional hernia in the scar of an unsound surgical enterprise." Other authors[1,2,6-8] have denounced the Bassini operation as being obsolete, inadequate, or actually injurious. Zimmerman[9] states that "it should be relegated to a place with other historic contributions which have in time become obsolete."

Such criticism stimulates reappraisal of a standardized procedure and encourages surgeons to seek other methods of dealing with the structural abnormalities about the inguinal canal. It is obvious that the surgical treatment for indirect hernia is often unsound when applied to direct hernia. This fact becomes readily apparent when the differences in these two types of hernias are noted.

Indirect inguinal hernia is a congenital defect due to persistence of the processus vaginalis, and as such has no anatomic or physiologic relation to direct hernia. Indirect hernias which develop in adult life result from the same congenital defect; however, the entrance into the processus vaginalis has been compressed by adequate muscle support about the internal ring. This muscle support is given by the arching fibers of the internal oblique and the transversus abdominis muscles which act as sphincters,[10] shutters or slid-

ing valves,[6] closing off the internal ring and compressing the processus vaginalis during such acts as coughing or straining.

Once the hernia is established, the most common defect is simple stretching and enlargement of the internal ring. Operative treatment at this stage should be directed toward complete obliteration of the sac with subsequent reinforcement of the transversalis fascia about the internal ring with a few sutures. When a weakness in the fascia of Hesselbach's triangle is not demonstrated, or a small femoral sac is not present, revision of the posterior wall of the inguinal canal is probably unnecessary. Actually, the Bassini operation in such instances is likely to be harmful. The internal oblique muscle which would continue its function as additional support about the ring is rendered ineffective when it is anchored to the inguinal ligament.

Direct inguinal hernia is a dome-shaped bulging of the peritoneum and transversalis fascia into the floor of the inguinal canal. It is seen most often in the middle and old age groups, rarely in women and children. It has no causal relationship to the spermatic cord, or to the descent of the testes. Only rarely does it become incarcerated, or enter the scrotum. Direct hernia results from a weakness of the transversalis fascia within Hesselbach's triangle, often associated with a high insertion of the internal oblique muscle into the rectus sheath. In such instances, the internal oblique muscle does not reach the pubic tubercle but terminates by inserting on the rectus sheath above the pubis, thus creating an inguinal triangle bound above by the internal oblique muscle, medially by the rectus sheath, and laterally by the inguinal ligament.

Andrews and Bissell[2] believe that high insertions of the internal oblique cause a loss of its mechanical advantage in preventing direct hernias. When the internal oblique muscle is attached to the pubis by a strong fibrous aponeurosis, support may be given the posterior wall of the inguinal canal during muscle contraction. If, on the other hand, the muscle inserts into the rectus sheath only, the inguinal triangle is not protected during periods of strain.

Mair[1] analyzed 100 dissections and tabulated the following data regarding the insertion of the internal oblique muscle:

(a) 46 per cent inserted with a stout fibrous attachment into the pubis;

(b) 20 per cent inserted into the rectus sheath one inch above the pubis;

(c) 34 per cent inserted into the rectus sheath down to the pubis.

Studies conducted on 100 cases of inguinal hernia at the Grady

Memorial Hospital demonstrated the following variations in the insertion of the internal oblique muscle (fig. 1):

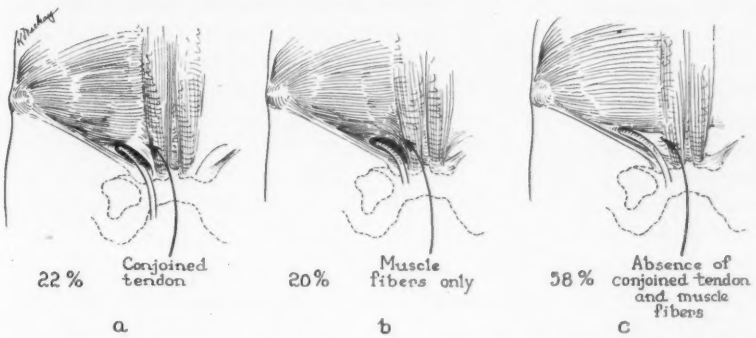

Fig. 1. Anatomic arrangement of the internal oblique muscle in 100 inguinal hernias.

(a) 22 per cent inserted into the pubis as a fibrous aponeurosis;

(b) 20 per cent inserted into the pubis as fleshy muscle tissue;

(c) 58 per cent inserted directly into the rectus sheath at distances varying between 0.5 and 4.5 cm. above the pubic tubercle.

It is evident that the wide variations in the site of insertion of the "conjoined tendon" (internal oblique muscle) necessitate certain modifications in the surgical procedure selected. When the conjoined tendon inserts into the rectus sheath at some distance above the pubic tubercle and is sutured to the inguinal ligament, a weakness exists just lateral to the pubic tubercle and favors recurrence at this site. Clark and Hashimoto[11] found that of the recurrent hernias they studied, 75 per cent had recurred at this site. They recommended utilization of the ligament of Henle (falx aponeurotica inguinalis), the ileopubic tract, and Cooper's ligament in the repair of inguinal hernias. The ileopubic tract is a thickened band of transversalis fascia which lies posterior and parallel to the inguinal ligament. It may be traced from the iliopsoas fascia to the pubic tubercle and is best seen when the inguinal ligament is lifted anteriorly. Its utilization adds much to strengthening the medial angle.

Earlier, McVay[12] had stated that a fundamental error in herniorrhaphy was the suture of the so-called "conjoined tendon" to the inguinal ligament. He called attention to the fact that the inguinal ligament is a free margin, not attached to transversalis fascia or fascia lata except by contiguity of tissues. The inguinal ligament not being a fixed structure may be pulled upward when sutured to

the abdominal musculature, thus exposing the inguinal canal from below. Noting variations in the insertion of the internal oblique muscle, McVay[13] regarded the conjoined tendon as an artefact in most instances, but found the falx aponeurotica inguinalis a constant structure formed as a lateral fibrous expansion of the rectus abdominis tendon of insertion, attaching fan-like on the pecten of the pubis. The McVay hernioplasty utilizes Cooper's ligament rather than the inguinal ligament as an anchor to which the transversalis fascia is sutured. Harkins[14,15] recommended this operation as the procedure of choice for the repair of both types of inguinal hernias and for femoral hernias.

The type of operation employed in the series of 100 primary, uncomplicated inguinal hernias at Grady Memorial Hospital depended entirely upon the anatomic findings in each instance. On no occasion was a method of repair chosen prior to operation. At operation, particular emphasis was placed on adequate exposure of the ileopubic tract, the falx aponeurotica inguinalis, the transversalis fascia, and the insertion of the internal oblique muscle. The details of repair were decided upon after these structures were visualized and evaluated; consequently, a variety of procedures were employed. In all instances, high ligation of the sac in indirect hernias was accomplished. Direct sacs were transposed lateral to the epigastric vessels (Hoguet),[16] and in one instance a small femoral sac was similarly obliterated. Exploration of the abdomen in the area was carried out routinely by inserting the finger through the sac. A careful search for femoral hernia was made by palpation of the femoral ring from within the abdominal cavity; in one patient a small femoral sac was found.

The ileopubic tract, recently popularized by Clark and Hashimoto, was found to be particularly constant and was utilized in 40 cases, suturing the tract to adjacent transversalis fascia. This tract is usually mobile, a factor which allows plication of the transversalis fascia to be accomplished without tension. Suture of the transversalis fascia to Cooper's ligament was employed in 23 instances. Often combinations of previously described methods of hernioplasty were used, such as utilization of a flap of external oblique fascia (Zimmerman)[17] to reinforce a hernioplasty of Cooper's ligament, or a flap of rectus sheath turned down and sutured to transversalis fascia to strengthen an ileopubic tract type of repair. In 7 cases of early indirect hernias, ligation of the sac was the only procedure carried out. Ligation of the indirect sac with imbrication of the external oblique fascia posterior to the spermatic cord was employed in 19 cases. In 11, the transversalis fascia was sutured to the inguinal ligament. Fine cotton or silk sutures were used exclusively.

The necessity of avoiding tension in hernia repairs has prompted the use of a wide variety of grafting and bridging procedures. Wangensteen[18] recommended fascia lata grafts; McNealy[19] vitallium plates; Mair,[20] full thickness skin implantation; and Throckmorton,[21] tantalum gauze. Others have used silver wire filigrees, cutis skin grafts and lattice-work of tendon and fascia. These operations represent attempts to reinforce weak areas without welding adjacent structures together under tension and without disturbing the myodynamics of the inguinal canal. While grafting procedures were not utilized in this series of 100 cases, they can be of great value, and on occasion may be necessary.

It is probable that too much emphasis has been placed on the choice of suture materials. Catgut, plastigut, tendon, fascial strips, cotton, linen, silk, and many others have their proponents. Certainly the choice of suture material is less important than the choice of operation. There is little evidence that the usual suture materials per se have much bearing on the final results of the operation.

SUMMARY

An ideal operation for correcting all inguinal hernias has not been found, yet the surgical treatment of hernias has long followed the same basic pattern, which is the suture of the "conjoined tendon" to the inguinal ligament. An anatomic study of 100 inguinal hernias revealed great variation in the insertion of the conjoined tendon (internal oblique muscle), indicating the necessity of adapting the method of repair to the anatomic and pathologic findings at operation. The methods of repair used in this series are described briefly.

REFERENCES

1. Mair, G. B.: A Criticism of the Bassini Operation and Its Modifications, Brit. M. J. *2:*178-181 (Aug. 11) 1945.
2. Edwards, H.: Inguinal Hernia, Brit. J. Surg. *31:*172, 1943-44.
3. Andrews, E., and Bissell, A. D.: Direct Hernia: A Record of Surgical Failures, Surg., Gynec. & Obst. *58:*753, 1934.
4. Mastin, E. V.: An Operation for the Cure of Inguinal Hernia, Ann. Surg. *115:*756-760 (May) 1942.
5. Ogilvie, W. H.: Discussion on the Operative Treatment of Uncomplicated Inguinal Hernia, Proc. Roy. Soc. Med. *30* (Part 1):532, 1936.
6. Iason, A. H.: Why Hernias Recur, Am. J. Surg. *72:*550-561 (Oct.) 1946.
7. Brandon, W. J. M.: Inguinal Hernia; House that Bassini Built, Lancet *1:*167-171 (Feb. 10) 1945.
8. Cumberlidge, W. I.: Discussion on the Operative Treatment of Uncomplicated Inguinal Hernia, Proc. Roy. Soc. Med. *30* (Part 1): 529, 1936.
9. Zimmerman, L. M.: Essential Problems in the Surgical Treatment of Inguinal Hernia, Surg., Gynec. & Obst. *71:*654-663 (Nov.) 1940.
10. MacGregor, W. W.: The Demonstration of a True Internal Inguinal Sphincter and Its Etiologic Role in Hernia, Surg., Gynec. & Obst. *49:*510, 1929.

11. Clark, J. H., and Hashimoto, E. I.: Utilization of Henle's Ligament, Iliopubic Tract, Aponeurosis Transversus Abdominis and Cooper's Ligament in Inguinal Herniorrhaphy; Report of 162 Consecutive Cases, Surg., Gynec. & Obst. *82:*480-484 (April) 1946.
12. McVay, C. B.: A Fundamental Error in the Bassini Operation for Direct Inguinal Hernia, Univ. Hosp. Bull., Ann Arbor *5:*14, 1939.
13. McVay, C. B.: An Anatomic Error in Current Methods of Inguinal Herniorrhaphy, Ann. Surg. *113:*1111, 1941.
14. Harkins, H. N.; Szilagyi, D. E.; Brush, B. E., and Williams, R.: Clinical Experiences with the McVay Herniotomy; 131 Personal Cases, Surgery, *12:*364-377 (Sept.) 1942.
15. Harkins, H. N., and Schug, R. H.: Hernial Repair Using Cooper's Ligament, Arch. Surg. *55:*689, 1947.
16. Hoguet, J. P.: Direct Inguinal Hernia, Ann. Surg. *72:*671, 1920.
17. Zimmerman, L. M.: Inguinal Hernia; The Surgical Treatment of Direct Inguinal Hernia, Surg., Gynec. & Obst. *66:*193-198, 1938.
18. Wangensteen, O. H.: Repair of Recurrent and Difficult Hernias and Other Large Defects of the Abdominal Wall Employing the Iliotibial Tract of Fascia Lata as a Pedicled Flap, Surg., Gynec. & Obst. *59:*766, 1934.
19. McNealy, R. W., and Glassman, J. A.: Vitallium Plates Used in Repair of Large Hernias, Illinois M. J. *90:*170-173 (Sept.) 1946.
20. Mair, G. B.: Preliminary Report on the Use of Whole Skin-Grafts as a Substitute for Fascial Sutures in the Treatment of Herniae, Brit. J. Surg. *32:*381-385 (Jan.) 1945.
21. Throckmorton, T. D.: Tantalum Gauze in the Repair of Hernias Complicated by Tissue Deficiency, Surgery *23:*32 (Jan.) 1948.
22. Fallis, L. S.: Recurrent Inguinal Hernia, Analysis of 200 Operations, Ann. Surg. *106:*363-372, 1937.
23. Patrick, W. T.: Recurrent Hernia, An Investigation of the Causes of Recurrence and the Application of the Principles of Treatment of the Primary Lesion, Brit. J. Surg. *31:*231, 1933-34.

The Southern Surgeon

Published Monthly by
The SOUTHERN SURGEON PUBLISHING COMPANY
701 Hurt Building
ATLANTA 3

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Editor

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Subscription in the United States, $5.00

Volume XIV | DECEMBER, 1948 | Number 12

THE SOUTHWESTERN SURGICAL CONGRESS

Greetings to the Southwestern Surgical Congress! The surgeons of the great Southwest, in historic fashion, have undertaken to blaze a wide new trail for the advancement of surgery in the far-flung regions which comprise their section of the country.

This new surgical society is the outgrowth of a real need. To the present time, there have been only four regional surgical associations in the United States, and none of these include men from the Southwest. The Western Surgical Association has a limited number of members from this area, but aside from these few, there are approximately 2300 surgeons in nine Southwestern states without any affiliation with regional societies. Under this circumstance, it was inevitable that forward-looking Southwestern surgeons should recognize the necessity for an organization of the growing numbers of their confreres in that section and decide to do something about it.

As a first step toward the creation of such an organization, several surgeons from different cities throughout the territory held a meeting in Oklahoma City on Oct. 3, 1948. To this meeting they invited as consultants a group of men who had been active in the development of The Southeastern Surgical Congress. A formal organization was set up by the election of temporary officers, con-

sisting of Dr. Walter G. Stuck, of San Antonio, as President, and Dr. C. R. Rountree, of Oklahoma City, as Secretary. It was voted unanimously that the society should be called the Southwestern Surgical Congress and that it should include surgeons from Arizona, Arkansas, Colorado, Kansas, Missouri, New Mexico, Oklahoma, Texas and Utah. The President appointed one man from each of the nine states as chairman of a committee whose duty it would be to direct the membership in their respective states. The first meeting of the Congress is to be held in one of the Southwestern cities early in 1949; at that time a permanent organization will be set up and a constitution and by-laws adopted.

The Congress will be open to men in all the specialties. The number of members will be unlimited, though members must have certain qualifications. These qualifications will be much the same as those required by the American College of Surgeons. The Congress, however, will in no way conflict with the American College or with any other medical or surgical organization.

Members of the Southeastern Surgical Congress will no doubt be pleased to know that the Southwestern surgeons selected THE SOUTHERN SURGEON as the official journal for their publications. This should add materially to the prestige of THE SURGEON and increase its influence as a top-ranking journal.

The initial meeting of these Southwestern surgeons was a most stimulating one; all were enthusiastic and the entire atmosphere augured well for a highly useful and progressive organization. There is no question that the Congress will prove a stimulus to more research and writing and that it will play an outstanding rôle in the surgical affairs of the Southwest and of the country as a whole.

Since this meeting in Oklahoma City, the outcome of the presidential election has caused the medical profession to be confronted with a serious problem. Under the present administration, it seems more than ever likely that attempts will be made to pass legislation for compulsory health insurance, which in substance means socialized medicine. It is common knowledge that in all the countries wherein it has been tried, socialized medicine has been a dismal failure. Not only has it failed to provide adequate medical service for the people, but it has proved unsatisfactory to the doctors, and has had a deleterious effect upon medical progress. Individual initiative has been lost, medical organizations have disintegrated, and medical literature has declined. America alone is left to keep the standards of medicine on a high plane. Under our present system of free enterprise and competitive practice of medicine, the average span of life has been greatly prolonged, and the health of our people

is better than it has been in the history of the nation. The requirements for medical practice are high and are constantly being elevated. Medical students are being thoroughly trained, and postgraduate courses are being made available to all. Any plan of regimentation or socialization of medicine which would destroy its competitive spirit would lower our standards of scientific achievement and the quality of our service to the public. We must employ every means at our command to combat such a state of affairs. The newly organized Southwestern Surgical Congress, by combining its influence with that of The Southeastern Surgical Congress, can help solidify the South in a strong movement to prevent the passage of this vicious legislation.

The surgeons of the Southwest have an opportunity and an obligation. We congratulate them upon their opportunity and pledge them our full cooperation in the fulfillment of their obligation to aid in upholding the ideals and practices of our profession, that we may all continue to give our best efforts to the promotion of medical and surgical progress.

R. L. SANDERS, M.D.

ANNOUNCEMENT OF VAN METER PRIZE AWARD

The American Goiter Association again offers the Van Meter Prize Award of Three Hundred Dollars and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The Award will be made at the annual meeting of the Association which will be held in Madison, Wisconsin, May 26, 27, and 28, 1949, providing essays of sufficient merit are presented in competition.

The competing essays may cover either clinical or research investigations; should not exceed three thousand words in length; must be presented in English; and a typewritten double spaced copy sent to the Corresponding Secretary, Dr. T. C. Davison, 207 Doctors Building, Atlanta 3, Georgia, not later than March 15, 1949. The committee, who will review the manuscripts, is composed of men well qualified to judge the merits of the competing essays.

A place will be reserved on the program of the annual meeting for presentation of the Prize Award Essay by the author if it is possible for him to attend. The essay will be published in the annual Proceedings of the Association. This will not prevent its further publication, however, in any journal selected by the author.

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VOLUME XIV DECEMBER, 1948 NUMBER 12

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Published Monthly
by
THE SOUTHERN SURGEON PUBLISHING CO.
701 Hurt Building
Atlanta 3, Ga., U.S.A.

Entered as Second-Class Mail Matter June 25, 1946, at the Post Office at Atlanta, Ga., Under the Act of March 3, 1879.

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Manuscripts for publication, books for review, and correspondence relating to the editorial management should be sent to Dr. B. T. Beasley, *Managing Editor*, 701 Hurt Building, Atlanta.

Articles will be accepted for publication on condition that they are contributed solely to *The Southern Surgeon*. Manuscripts must be typewritten, double-spaced, and the original copy should be submitted. They are all subject to editing. The cost of illustrations must be borne by the author.

References should conform to the style of the Quarterly Cumulative Index Medicus, published by the American Medical Association. This requires, in order given: name of author, title of article, name of periodical, with volume, page, month (day of month if weekly) and year.

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The Southern Surgeon is published monthly. Subscription price in the United States and Canada: $5.00; in other countries: $6.00, including postage. Single copies, $1.00 postpaid.

Checks may be made payable to The Southern Surgeon Publishing Co.